

USING A SOCIAL COMMUNICATION INTERVENTION TO IMPROVE SOCIAL
INTERACTIONS AND EMPLOYMENT EXPERIENCES OF ADOLESCENTS WITH
HIGH FUNCTIONING AUTISM SPECTRUM DISORDERS

By

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ABSTRACT

This study evaluated the effectiveness of cognitive-behavioral social communication intervention on improving the social reciprocity and employment experiences of adolescents with High Functioning Autism Spectrum Disorders (HFASD). Four youth diagnosed with a HFASD participated in this study. A multiple baseline across skills design provided targeted measurement of the intervention, which included conversation supported language techniques, peer model role plays, social behavior mapping, and review and feedback. Conversational data were collected in the analogue and employment settings on the use of: (a) supportive comments, (b) follow-up questions, and (c) bridging comments or questions. The four participants were enrolled in a community-based work experience program as part of the school curriculum. The analogue training occurred in the high school setting once to twice a week, and observational data were collected once a week in the employment setting on conversations between coworkers and participants. The employer also rated the participants weekly on their employability and social skills..

In both settings, some improvements occurred in the use of supportive comments by three of the four participants in both settings. Some impact occurred on follow-up questions for three of the four participants. No significant findings occurred for bridging comments or questions. The researcher developed a threshold that compared the target skill use among non-disabled peers and determined that during intervention the participants demonstrated skill use commensurate with their non-disabled peers. As well, social validity interviews of participants, teachers, and employers supported the usefulness of the intervention. Furthermore, employability ratings indicated that

workplace social interactions and social skills necessary for employment settings improved for the participants over the course of the study.

CHAPTER ONE

Introduction

The last fifteen years have seen significant growth in the identification of children and youth with Asperger Syndrome (AS), High Functioning Autism (HFA), and Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS). These three categories have been collectively referred to as High Functioning Autism Spectrum Disorders (HFASD). As children with HFASD enter adolescence and young adulthood, they will be seeking adult employment. Unfortunately, little empirical evidence exists to identify best practices that support successful employment experiences for adolescents and adults with HFASD (Howlin, 2000; Howlin, Alcock & Burkin, 2004; Mawhood & Howlin, 1999). However, narrative accounts of adults with HFASD in employment settings have suggested that adolescents must be adequately prepared for the social and cultural changes adult employment may require (Clavenna-Deane, 2009; Wehman, Datlow-Smith, & Schall, 2009). These accounts recognize, specifically, the need for practice with social communication, perspective taking, and problem solving skills.

One of the characteristic challenges for individuals with HFASD is successfully navigating the communication dynamics of social settings (Simpson, Myles, & LaCava, 2008; Seltzer, Krauss, Shatuck, Orsmond, Swe, & Lord, 2003; Wing, 1992). Misinterpreting social and contextual cues (Myles & Simpson, 2002; Wing, 1992); difficulties interpreting the perspectives and emotions of others (Baron-Cohen, 1995) and challenges maintaining equitable, reciprocal conversations present significant difficulties for individuals with HFASD (Myles, 2005). Employment settings exacerbate this problem as they require employees to agilely display such communication skills on an

ongoing basis (Barnhill, 2007; Clavenna-Deane, 2009; Hurlbutt & Chalmers, 2004; Jennes-Coussens, Magill-Evans, & Konig, 2006). In addition, most places of employment have unwritten socialization rules based on their culture and environment, which may cause further difficulty for the individual with HFASD in determining the most appropriate strategies for entering and maintaining conversations (Muller, Schuler, Burton, & Yates, 2003).

Social communication interventions taught to individuals with Autism Spectrum Disorders have traditionally focused on discrete social skill training such as initiating, maintaining, and ending a conversation (Rao, Beidel, & Murray, 2008). These interventions target the verbal and non-verbal communication skills of the *participant* (White, Koenig, & Scahill, 2007). The participant is often provided with scripts and other actions used to initiate and maintain a conversation, as well as steps to improve his or her appropriate proximity and eye contact (Rao, Beidel, & Murray, 2008). These approaches often do not include strategies the individual can use to assess the non-verbal communication of the communication partners or established groupings in the social setting (Bauminger, 2002; Crooke, Hendrix, & Rachman, 2007; Winner, 2007).

Social cognitive communication strategies that include problem solving and perspective taking skills have assisted the participant to use these skills in addition to the discrete social skills found in traditional models (Bauminger, 2007a, 2007b). A focus is placed on evaluating other people's perspectives, intents, and non-verbal actions as well as the environment and culture of the social setting while continuing to teach the appropriate verbal and non-verbal language of the participant (Winner, 2007). Evaluating the intentions of the conversation partners is critical for a successful

reciprocal conversation with an individual, dyad, or group (Wing, 1992). Employment settings often have varied groupings, pairings, and unwritten rules that need to be evaluated by the individual with HFASD in order to maintain conversations with coworkers and employers (Hurlbutt & Chalmers, 2004). Therefore, social cognitive communication strategies that address problem solving and perspective taking should be coupled with employment experiences as a means to improve the employability of individuals with HFASD.

Study Overview

In an effort to ameliorate social and communication difficulties of adolescents with HFASD in employment settings, this study used an intervention consisting of social cognitive communication strategies focusing on problem solving and perspective taking. The strategies were: (a) conversation supported language, (b) social behavior mapping, (c) peer model role plays, and (d) review and feedback sessions. The purpose of this study was to evaluate the use of these strategies to improve the reciprocal social interactions as well as the employability skills of adolescents with HFASD. The conversational skills addressed in this study were: (a) supportive comments, (b) follow-up questions, and (c) bridging comments or questions. The following research questions were addressed:

- (1) Will social cognitive communication and social problem solving interventions improve the reciprocal social interactions of adolescents with HFASD in a controlled setting?
- (2) Will the reciprocal social interaction skills generalize to an employment setting?

- (3) Will the employers' ratings of overall employability skills increase as a result of the intervention?
- (4) How will participants and school personnel assess the usefulness and effectiveness of the intervention?

A small group, multiple baseline across skills design was employed to provide targeted measurement of the intervention. Continuous data on the aforementioned conversational skills were collected in both the training and the generalization, employment setting. In addition, the participant's employability skills were rated weekly by each participant's employer to assess the improvement in social communication skills associated with employability.

Four adolescents with HFASD were recruited from a Midwestern high school. These participants were enrolled in a community-based work experience program as part of their course of study. They ranged in age from seventeen to twenty-one years of age and had either AS, PDD-NOS, or HFA. Training and observations of conversations occurred in the analogue, high school setting once to twice a week with peers without disabilities acting as peer model conversation partners. Additionally, observations occurred in the participant's employment setting once a week, where the participants and coworkers engaged in conversations during either joint work activities or break times.

CHAPTER TWO

Literature Review

Empirical evidence presented in this literature review will identify the social communication characteristics that have impacted the employment outcomes of adolescents and young adults with High Functioning Autism Spectrum Disorders (HFASD). This chapter will present literature supporting the verbal and non-verbal communication characteristics associated with HFASD, such as deficits in theory of mind, and challenges with social problem solving. As well, evidence verifying the employment challenges adolescents and young adults with HFASD have experienced will be examined to highlight the need for quality employment interventions. Finally, cognitive-behavioral social communication intervention literature will be presented to support the conceptual framework of this study.

Characteristics of High Functioning Autism Spectrum Disorders

Dynamic, unpredictable social situations present considerable challenges for adolescents and young adults with HFASD. Asperger Syndrome (AS), High-Functioning Autism (HFA), and Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS) constitute the identifiable disorders within the High Functioning Autism Spectrum that are the focus of the current study. Individuals with HFASD share similar cognitive, social, and communication characteristics that impair their ability to engage in natural discourse (Colle, Baron-Cohen, Wheelwright, & Van Der Ley, 2008). Characteristically average to above average intellectual capacity allows individuals with HFASD to acquire and retain large quantities of information related to their restrictive interests (Myles & Simpson, 2002). Yet deficits in social communication often lead to a self-indulgent focus

on restrictive, repetitive interests and limited sensitivity to other points of view (Bennett et al, 2008; Colle et al., 2008; Seltzer, Krauss, Shatuck, Orsmond, Swe, & Lord, 2003). Furthermore, limited restrictive conversations that diminish the opportunity for a reciprocal social interaction involving the mutual, equitable exchange of information can occur (White, Koenig, & Scahill, 2007).

Reciprocal interactions can be further impeded when deficits in theory of mind associated with HFASD impact the individual's ability to accurately interpret the intents and emotions of their conversation partners (Baron-Cohen, 1995; Ozonoff, Pennington, & Rogers, 1991; Simpson, Myles, & LaCava, 2008). Misinterpretations of verbal and non-verbal social cues with conversational partners can create problems in sustaining meaningful friendships (Wing, 1992). The present study proposed to improve the social reciprocity, theory of mind, and social problem solving characteristics that impact successful social interactions of adolescents and adults with HFASD, as these characteristics are of particular concern for adolescents with HFASD who are preparing for adulthood where social interactions occur throughout all adult life domains.

Social communication characteristic deficits. Unlike individuals with classic autism, individuals with HFASD desire and seek out social interactions (Wing, 1992). However, their attempts may falter due to their inability to respond to the dynamic nature of conversations and the social cues of a conversation partner. Such problems become a critical issue during adolescence when effectively navigating social experiences is critical for establishing and maintaining friendships (Myles & Simpson, 2002). These authors have maintained that the social cognitive deficits of individuals with HFASD inherently impact reciprocal communicative interactions. Reciprocity is equity in a conversation,

where each conversation participant provides information as well as effectively takes turns and changes topics (Landa, 2000). LaRocque and Leach (2009) stated that “a child who displays social reciprocity is aware of the emotional and interpersonal cues of others, appropriately interprets those cues, responds appropriately to what he or she interprets, and is motivated to engage in social interactions with others” (p.2). Furthermore, these authors asserted that people who demonstrate effective social reciprocity are able to continue equitable interactions for extended periods of time and subsequently learn new skills from these engagements. Unfortunately, the inability to establish reciprocity in social interactions is characteristic of HFASD (Myles, 2005).

Individuals with HFASD often can effectively initiate a topic related to a topic of self-interest, however, the conversation can become one-sided as the individual may engage in a repetitive and restrictive conversation about the topic rather than establishing a reciprocal and equitable interaction (Myles, 2005). When a conversation becomes one-sided, the individual with HFASD often misinterprets the social cues that may indicate the partner’s declining interest, which can further decrease the equity of the conversation. Such a lack of response to a partner’s declining conversational interest often leads to the partner exiting the conversation (Landa, 2000).

The lack of social reciprocity associated with HFASD continues to permeate all domains of an individual’s academic, social, and emotional development. Rao, Beidel and Murray (2008) asserted that deficiencies in social and communication skills have impacted the quality and sustainability of meaningful adult, peer, and familial relationships for children with HFASD. These authors reported that during adolescence and adulthood few close relationships and a marked decrease in social competence

negatively impact typical developmental milestones such as: academic, employment, and personal relationships. Myles and Simpson (2002) reported that as adolescents with HFASD mature they “may find themselves more and more in conflict with prevailing social norms” (p. 133) as demonstrating intact social skills is necessary for achieving personal and professional goals.

According to Klin, Volkmar, and Sparrow (2000), while adolescents with HFASD may understand the communication conventions necessary to initiate and maintain a conversation, they often cannot apply these skills during the natural flow of a conversation. Landa (2000) and Gaus (2007) described three requisite pragmatic language skills necessary for social conversational success: (a) expressing communicative intent, (b) presupposition, and (c) discourse organization. Individuals competent in communicative intent “recognize situations in which intentions should be expressed indirectly...[and] have the linguistic flexibility to select appropriate forms for expressing intention” (Landa, 2000, p. 129). Altering the course of the conversation based on contextual references and being able to interpret the intentions of conversation partners are challenging for adolescents with HFASD. Presupposition skills allow an individual to presume and adjust to the context of the situation. However, individuals with HFASD may falter because of their rigid behavioral responses rather than altering their responses to changes in the conversational context (Gaus, 2007; Landa, 2000). Finally, Gaus (2007) contended that the natural social discourse is often interrupted when the adolescent with HFASD becomes verbose; makes tangential unrelated comments; and misinterprets the contextual language cues in the social setting.

Theory of mind characteristics. The interruption of the natural exchange of discourse as well as the difficulty adjusting to the context of the situation have been attributed to deficits in theory of mind. Theory of mind has been defined as accurately inferring the emotions of others, (Baron-Cohen, 1995; Frith, 2001), understanding the perspectives of others (Winner, 2007), and interpreting non-verbal communication signals of eye gaze and physical proximity (Myles & Simpson, 2002). Theory of mind refers to an individual's ability to "attribute mental states to oneself or another person... and is the main way in which we make sense of or predict another person's behavior" (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001, p. 241).

A cognitive component to theory of mind involves the ability to focus on a conversation partner's feelings and interests and understand the partner's perspective. A concomitant emotional component has been described as the ability to interpret and accurately respond to a partner's feelings (Frith, 2001). Frith suggested that typically developing individuals demonstrate the cognitive and emotional components through an "implicit theory of mind...[that] allows them to explain and predict other's behavior in terms of their presumed thoughts and feelings" (p. 969). Frith refers to this natural behavior as mindreading.

Conversely, individuals with HFASD have been described as having mindblindness, meaning they are unable to infer the mental states, desires, and beliefs of others and often make inaccurate social and communication assumptions (Baron-Cohen, 1995; Frith, 2001). Fletcher and colleagues (1995) asserted that deficits in theory of mind are the core social impairment for individuals with HFASD. They suggested that theory of mind deficits negatively influence the ability of individuals with HFASD "to

conduct a flexible conversation taking into account the interest of others” (p. 110). The failure to remain flexible and be able to interpret the changing interests and intents of the conversational partners often results in a communication breakdown.

Research has suggested that, compared to typically developing participants, individuals with HFASD are significantly less accurate at theory of mind tasks such as inferring the thoughts and feelings of others (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001; Heavey, Phillips, Baron-Cohen, & Rutter, 2000). Heavey and colleagues (2000) explored theory of mind differences between typically developing adults and adults with HFASD. In this study, participants were asked to interpret the feelings and mental states of characters in film excerpts by examining the context of the setting as well as the social situation. A significant difference existed between the typically developing adults (control group) and the individuals with HFASD (experimental group); with the control group demonstrating superior performance as compared to the experimental group. Their findings supported the theory that individuals with HFASD have significant discrepancies in theory of mind tasks.

Baron-Cohen and colleagues (2001) conducted a similar study that measured the theory of mind of individuals with HFASD as compared to typically developing participants. These researchers presented photographs of faces with just the eyes visible. The participants were asked to interpret the emotions of the individuals in the photograph based on their eye expressions as well as the eye gaze direction. The results suggested that the participants with HFASD were significantly impaired in their ability to interpret the emotions of others when compared to matched peers without disabilities.

Ponnet, Roeyers, Buysse, DeClerq, and Van Der Heyden (2004) investigated theory of mind characteristics of individuals with HFASD and found statistically significant differences between the participants and their non-disabled peers when presented with dynamic mind-reading tasks. These tasks required the participants to interpret the inferred thoughts and feelings of characters in a video. The individuals with HFASD had greater difficulty inferring the emotions of the characters in the videos than the typically developing participants. The authors surmised that a dynamic setting, as exemplified using videos, presented great difficulty for individuals with HFASD in that it requires them to simultaneously interpret multiple social cues indicating emotions. The participants with HFASD's inability to accurately infer the mental states and feelings of the actors in the video indicated theory of mind deficits for the participants.

Theory of mind research has demonstrated challenges for adolescents with HFASD in developing and sustaining meaningful relationships. Theory of mind deficits impact the ability to interpret a conversational partner's emotions and intents and thereby alter the topic to support such changes and maintain equity in the conversation. Deficits in theory of mind can exacerbate social problems for adolescents with HFASD when effectively navigating social experiences becomes an avenue for establishing and maintaining friendships (Myles and Simpson, 2002).

Social problem solving characteristics. In order to interpret the intents of others as well as understand their social and emotional cues, an individual with HFASD must agilely problem solve the nature of the cues and the resulting changes in the conversation. Social problem solving during natural discourse requires the cognitive flexibility to develop open-ended responses to contextual changes in a conversation (Channon,

Charman, Heap, Crawford, & Rios, 2001). Adolescents with HFASD often have difficulty responding to such contextual changes during natural, spontaneous conversations. The characteristic social impairments associated with HFASD are most apparent in dynamic settings where multiple non-verbal cues occur simultaneously (Winner, 2007). An individual with HFASD may be able to interpret the tone of voice of another person, however, interpreting all commonly occurring, non-verbal actions (i.e. facial expressions, tone of voice, gestures, proximity, and positioning) can lead to misinterpretations (Myles & Simpson, 2002). In addition, adolescents with HFASD often adhere to a rigid set of socialization rules that do not account for temporal, situational, and relational changes (Myles, 2005). For example, adolescents with HFASD may apply the same rules when speaking with an adult as with a peer, instead of altering their responses and level of formality as the environment changes.

Empirical research on social problem solving has been conducted in order to measure the specific skill deficits associated with HFASD. One study by Channon and colleagues (2001) suggested that adolescents with HFASD have particular difficulty determining solutions to communicative breakdowns as well as responding quickly to changes in social situations. In this study, the authors compared students with HFASD and typically developing students on their ability to generate solutions to real-life videotaped scenarios. The results revealed that adolescents with HFASD generated fewer high quality solutions, were less likely to choose the best solutions, and exhibited lower levels of abstract problem solving. The researchers determined quality by scoring the participant's responses on three categories: appreciation of the problem, social appropriateness, and practicality of the resolution. Two raters blind to the study

conducted this scoring and received 94% interobserver agreement on their interpretations of solution quality. The authors suggested that the participants with HFASD possessed “a poorer ability to take into account the social consequences of their solutions and...their solutions tended to produce less practical outcomes” (p. 467).

Social problem solving empirical studies such as the one conducted by Channon and colleagues have focused on children and adolescents, however, few studies have explored the social problem solving performance of adults with HFASD. Goddard, Howlin, Dristchel and Patel (2007) addressed this gap by researching how past experiences impacted social problem solving for adults with HFASD as compared to typically developing adults. The authors administered an autobiographical memory cueing task and the Means-Ends Problem Solving test. During the autobiographical memory cueing task, the authors presented a positive, negative, or neutral word cue (e.g. leisure) and rated the retrieval of an autobiographical memory related to the cue on speed and specificity.

An analysis of variance was conducted between groups and emotions (positive, negative, and neutral) on the number of specific memories offered as a first response. As well, correlational analyses were conducted between the memory task scores and the MEPS scores to discern whether there was a relationship between memory performance and social problem solving. The authors hypothesized that compared to typically developing adults, adults with HFASD would have greater difficulty retrieving and using autobiographical memories and would show deficits in social problem solving in relation to the difficulty in retrieving autobiographical memories. Their results revealed no “overall differences in the tendency to retrieve memories in the context of problem

solving” (p.297). However, the adults with HFASD were less likely to retrieve memories with speed and accuracy and apply them to solutions. Their performance was significantly less effective and less detailed than the control group. These findings supported the challenges with social problem solving facing individuals with HFASD in social settings that require quick, agile responses to changes.

Furthermore, deficits in social problem solving have been linked to overall executive functioning difficulties, such as (a) the ability to plan, (b) use working memory to adapt to settings, (c) control impulses and inhibitions, (d) use cognitive flexibility in making decisions, and (e) initiate and monitor actions (Verte, Geurts, Roeyers, Oosterlaan, & Sergeant, 2006). To determine the specific areas of executive dysfunction, Hill and Bird (2006) compared the results of a group of typically developing adults on a large battery of executive functioning tasks to a matched group of adults with HFASD. The results indicated that individuals with HFASD had the greatest executive dysfunction in “response initiation and intentionality – the ability to engage and disengage actions in the service of overarching goals” (p. 2832). Agile problem solving during social communication interactions requires individuals to flexibly engage and disengage in actions during natural discourse. As this study reported, problem solving aspects of executive dysfunction associated with HFASD may inhibit the facilitation of natural discourse. Planning, multitasking, and abstract problem solving are critical for maintaining natural social communication, especially in adulthood where social situations exist in all life domains.

Social problem solving coupled with executive functioning activities allow individuals engaged in natural discourse to quickly evaluate the progress of a

conversation and adjust to the changes. Adults in groups as well as conversation dyads are required to make these quick alterations to maintain effective conversations.

Adolescents with HFASD need assistance in effectively adjusting conversations based on the changing perspectives of conversation partners in order to improve their adult employment outcomes.

Employment Outcomes for Individuals with HFASD

In adulthood, hallmark social communication characteristics associated with HFASD often can impact the ability to obtain and maintain employment (Jennes-Coussens, Magill-Evans, & Konig, 2006). The employment rates for people with HFASD have been reported as low as 31% (Howlin, 2000). Recent results from the National Longitudinal Transition Survey-2 (NLTS2) found similarly low employment rates for young adults with autism spectrum disorders (Cameto, 2005). In addition, individuals with HFASD are often employed in jobs well below their training. In fact, Eaves and Ho (2008) found that 30% of individuals with HFASD were employed in part-time or volunteer work that was well below the level of post-secondary education and training they had obtained.

Societal and personal costs. The societal costs resulting from the unemployment or underemployment of individuals with HFASD can be significant. In a recent report, Ganz (2007) determined that the consolidated lifetime cost of care for an individual with autism spectrum disorders was \$3.1 million, with lost income during adulthood totally more than \$970,000 over a lifetime. These lifetime costs impact both society and the individual due to the burden of services from lost employment wages. During unemployment phases, an individual with HFASD consumes more state and federal

services and funding than when working (Howlin, Alcock, & Burkin, 2005). Indeed, the range of services for individuals with HFASD can be extensive and encompass mental health services, daily living assistance, leisure services, health care services, and housing assistance (Knapp, Romeo, & Beecham, 2009). However, when individuals with HFASD have successfully maintained employment, the use of governmental services and benefits has decreased (Howlin, Alcock, & Burkin, 2005).

Relationship to social communication skill deficits. Limited employment success has been attributed to an inability to navigate multiple social interactions across dynamic settings as is required in most employment experiences (Barnhill, 2007; Clavenna-Deane & Morningstar, 2009a). Individuals with HFASD have articulated that their social and communication differences often lead to social isolation in the workplace (Clavenna-Deane, 2009; Jennes-Coussens, Magill-Evans, & Konig, 2006). Furthermore, these social and communication skill deficits may be associated with an inability to sustain competitive employment (Wehman, Datlow-Smith, & Schall 2009).

Anecdotal research has reported unsuccessful employment outcomes related to social and communication skill deficits. Muller, Schuler, Burton and Yates (2003) interviewed eighteen adults with HFASD who reported that communication and social interactions were among the major obstacles to successful employment. The participants stated that communication misinterpretations and failed social interactions often led to isolation at work and resulted in feeling “odd and different from everybody else” (p.169). The participants believed that their repeated misinterpretations of implicit as well as explicit meanings of a message had resulted in poor evaluations and repeated terminations. They asserted that their continued employment failures resulted in

placements in entry-level positions far below their qualifications (underemployment) and a lack of opportunities for career advancements out of the entry-level positions. Hurlbutt and Chalmers (2004) found similar themes after interviewing adults with HFASD.

Participants in their study reported that socialization and communication differences accounted for the greatest amount of job loss. Difficulties communicating with coworkers, inappropriately responding to unpredictable social interactions, and misinterpreting the intents of others during a conversation were recounted as preventing the participants from effectively maintaining employment.

In a more recent study, Clavenna-Deane (2009) interviewed adults with HFASD regarding employment and self-determination experiences. Many of them revealed multiple circumstances of unemployment and underemployment experiences as a result of their socialization and communication differences. These adults with HFASD acknowledged that social and communication differences affected their ability to act self-determined in the workplace. While all reported they had self-disclosed their disability and received accommodations from their employers, they indicated that social communication skills and an overfocus on restrictive topics were more challenging for them than workplace accommodations could provide. In many circumstances, these adults reported that their social and communication deficits resulted in termination. This research contributes to the growing body of research on the need for social and communication interventions in the workplace.

Employment intervention research. Few studies have investigated interventions to improve the employment outcomes of adults with HFASD. Mawhood and Howlin (1999) reported on a supported employment program (i.e. Prospects) for adults with

HFASD in the United Kingdom. Whereas traditional supported employment programs often concentrated on training individuals with disabilities on job tasks, the Prospects program focused on: (a) socialization between the employee and coworkers, (b) appropriate communication with supervisors and coworkers, and (c) ongoing problem solving. The authors described that the employment coaches served as a liaison between the employee and employer to address social and communication problems. In addition, the employment coaches educated the employers and coworkers about successful strategies to support positive social and communication interactions.

After two years, the number of individuals with HFASD placed in employment more than doubled from 8 to 19 (Mawhood & Howlin, 1999). The control group who were continuing the traditional supported employment system, increased from 3 to 5. Further longitudinal studies on Prospects revealed continued successful employment and growth for participants with HFASD. After eight years, 192 participants had obtained successful employment and were rating high levels of job satisfaction as a result of the Prospects supported employment scheme (Howlin, Alcock, & Burkin, 2005). In addition, the majority of the employment placements were in technical and scientific fields related to the participants' level of education. Finally, the authors also indicated that salaries increased for all participants over time.

Employment sites encounter multiple changes in personnel, tasks, and social rules; adjusting to these changes and the demands of a job can be a challenge for an individual with HFASD. Therefore, adults with HFASD may require employment support focused on social, communication, and problem solving skills to sustain successful employment. Prospects' promising results indicated the benefits that can be

achieved when introducing social and communication skill interventions into a supported employment scheme and providing ongoing problem solving support to the person with HFASD and the employer.

The strategies used in the current study target the social and communication skills of adolescents with HFASD in a similar manner to Prospects with the researcher acting as a social and communication employment coach. A focus is also placed on problem solving of successful and unsuccessful social and communication events in the school and workplace. The strategies are introduced across school and employment settings as a means to improve employment experiences prior to transitioning to adulthood. The conceptual framework visually represents the connection between the strategies, the skills, and the settings where the study will take place.

Conceptual Framework

The conceptual framework in Figure 1 aligns this study's cognitive behavioral social communication theoretical framework with the intervention components, the dependent variables and the generalization outcomes. The proposed intervention applies cognitive-behavioral therapy research and theory to develop a social communication intervention that incorporates four major components (i.e., social behavior mapping, conversation supported language, role play with peer models, and self-analysis and feedback). It is hypothesized that the power of the component elements of the social communication intervention will lead to short term outcomes of increased skills in analogue conversations. Further hypotheses include the generalization of the skills to natural employment settings.

Figure 1 Conceptual Framework of Study

Figure 1.

Conceptual Framework of Study.

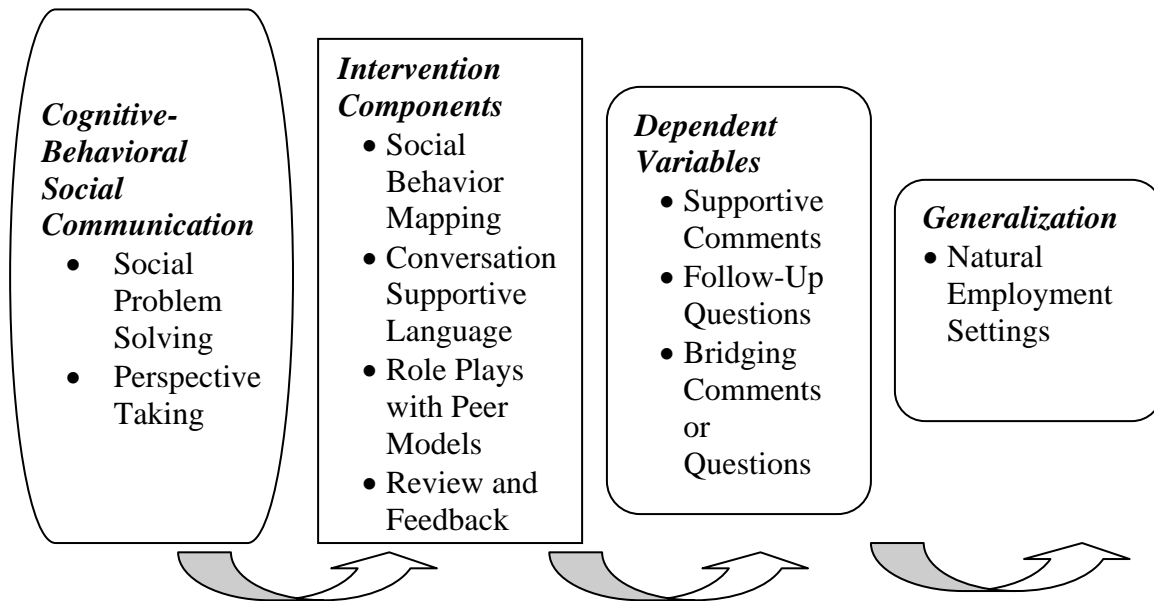


Figure 1. Note: Adapted from “Social Communication for Adolescents with Asperger’s and High Functioning Autism,” by M. E. Morningstar, R.S. Simpson, & B. A. Clavenna-Deane, 2010, grant proposal for National Institutes of Health R34 PA07-343 Competition.

Cognitive-behavioral therapy. Cognitive-behavioral therapy (CBT) has been used with people with psychiatric disorders for thirty plus years to treat anxiety disorders, depression, and panic disorders (Gaus, 2007). Cognitive-behavioral theory combines: (a) behavioral skills associated with social interactions, (b) cognitive skills related to processing information, and (c) affective skills of emotion recognition so as to “adapt flexibly to diverse social contexts and demands” (Bauminger, 2007a, p.1595). CBT applies the theory through psychotherapeutic interventions that train individuals to

cognitively monitor their behavior, modulate their emotional responses, and evaluate their personal, ongoing social consequences and communicative interaction results (Gaus, 2007). CBT follows a problem solving approach to identify destructive beliefs, attitudes, and behaviors and subsequently engage the participant in the generation of solutions and self-evaluation (Reinecke, Ryan & DuBois, 1998).

CBT requires that “people are active learners, ...they create their own learning environment” (Gaus, 2007, p. 131). In describing CBT, Sofronoff, Attwood, Hinton, and Levin (2007) stated that the participant “learns why we have emotions, the advantages and disadvantages of emotions, and the different levels of expression in him/herself and others” (p. 1204). These authors further explained that CBT provides a unique advantage for individuals with HFASD to engage in meta-cognition regarding individual behaviors and their impact on others. CBT offers a unique opportunity to address theory of mind deficits associated with HFASD across school and employment settings. CBT has been used with individuals with HFASD to address a variety of emotional, behavioral, and social challenges such as, obsessive-compulsive disorder (OCD) tendencies (Reaven & Hepburn, 2003), anger management (Sofronoff, Attwood, Hinton, & Levin, 2007), anxiety (Sze & Wood, 2007), and social cognition and problem solving (Bauminger, 2007a, 2007b; Gevers, Clifford, Mager, & Boer, 2006; Solomon, Goodlin-Jones, & Anders, 2004; Turner-Brown, Perry, Dichter, Bodfish, & Penn, 2008).

Reaven and Hepburn (2003) used CBT to decrease the presence of obsessive-compulsive behaviors in a seven year old child with AS. They conducted weekly therapeutic sessions that focused on the active participation of the child. During these sessions, the therapist and the participant mapped out a hierarchy of the OCD behaviors

from least to greatest distress. They also mapped out when the behaviors occurred, their duration, and possible response strategies to reduce the behaviors. The mapping activity addressed social contexts and an explanation of why the child needed to reduce her OCD behaviors in those contexts. In addition, the participant set goals with the therapist as to which strategies she would use and when, and her parents were requested to assist in reinforcing the strategy use at home. This increased the child's active participation in the therapeutic process, a key component of CBT, and allowed follow-up information from the parents. The child and her parents were interviewed prior to the start of therapy and after the 14 weeks using a measure of OCD characteristics. The results indicated a 65% decrease in the OCD behaviors after consistent use of the CBT over 14 weeks.

CBT has also been shown to address emotion recognition and regulation with individuals with HFASD. Sofronoff, Attwood, Hinton, and Levin, (2007) used an experimental control group design with over forty children with HFASD aged 10-14 years. The study utilized CBT during a 6 week program with over twenty children in the experimental group to problem solve hypothetical as well as realistic anger encounters. A wait-list control group of matched participants with HFASD was compared to the experimental group on the measures. The children completed two measures regarding their anger management, and the parents completed weekly ratings of the child's anger management as well as an inventory of anger. The researchers analyzed the quantitative measures using analysis of variance, and the parent social validity reports using qualitative design. The six session intervention consisted of activities in emotion recognition, explanation and demonstration of anger management strategies, analysis of social contexts, and choice making opportunities regarding strategy use. The results for

the experimental group at post-intervention indicated significantly fewer instances of anger toward family members and authority figures ($p < .0001$), and peers ($p < .05$). There were also significant main effects in time between the control group and the experimental group. The qualitative responses indicated positive growth in the children's anger control at home and parent/child use of the strategies. Strategies used in this study included supporting the participant to problem solve his behaviors and analyze others' behaviors. The authors indicated that pre-intervention inappropriate anger responses were often precipitated by obstacles, changes in routine, or required diversions from the participant's interests. The alternative solutions provided through the strategies appropriately addressed these frustrations and resulted in highly significant improvements in anger management.

Sze and Wood (2007) applied CBT to reduce anxiety-related symptoms in an 11 year old child with HFASD and to improve social skills that were affected by the anxiety. The authors implemented the intervention across fifteen sessions. The therapeutic sessions allowed the child and therapist to establish goals and alternatives to the typical anxiety responses the child exhibited. In addition, the sessions included teaching appropriate social interactions with parents and peers. This study used a problem solving framework to help the child cognitively reframe responses to anxiety-producing environments and activities. As well, typically developing peers were asked to interact with the child during recess and non-structured class times to model the socially appropriate behaviors and increase the child's inclusion in peer activities. This CBT approach significantly decreased the child's anxiety responses to the degree that she no

longer met the criteria for separation anxiety disorder and obsessive compulsive disorder with which she had been diagnosed.

Social cognition intervention research. Additional literature has also revealed the benefits of CBT to address social cognition and social problem solving characteristics, the specific factors addressed in the current study. These studies have used CBT to significantly improve social communication characteristics associated with HFASD, namely perspective taking that leads to social reciprocity (Bauminger 2007a, 2007b; Gevers, Clifford, Mager, & Boer, 2006) and social problem solving through improved cognitive flexibility and interpretation of social cues (Solomon, Goodlin-Jones, & Anders, 2004; Turner-Brown, Perry, Dichter, Bodfish, & Penn., 2008).

Perspective taking requires individuals with HFASD to interpret a conversation partner's verbal and non-verbal messages (Simpson, Myles, & LaCava, 2008). Perspective taking interventions have used the tenets of CBT to train participants on social cognition. Empirical research on perspective taking has addressed social communication for children with HFASD in both dyadic (Bauminger, 2007a) and group conversational settings (Bauminger, 2007b; Gevers, Clifford, Mager, & Boer, 2006; Turner-Brown, Perry, Bodfish, Dichter, & Penn, 2008). Interventions have included training on emotion recognition, cognitive restructuring of behaviors, and modulation of responses to changes in the environment (Bauminger, 2007a; Bauminger, 2007b; Gevers, Clifford, Mager, & Boer, 2006; Turner-Brown, Perry, Bodfish, Dichter, & Penn, 2008).

Gevers and colleagues (2006) implemented a 21 week social cognition training with 18 children with HFASD aged 8-11. This intervention focused on emotion recognition, perception and imitation, and interpreting humor and irony. The training

was conducted in a small group setting and parents were trained so the social cognitive skills could be reinforced across multiple settings. The researchers conducted pre and post assessments of theory of mind. The results indicated significant growth for the participants in interpreting humor and irony as well as perception and imitation. Post-intervention reports from parents indicated significant interpersonal and social skill growth for the children. The findings suggested that social cognitive interventions may improve theory of mind capabilities for children with HFASD.

Turner-Brown and colleagues (2008) expanded the research of group-based cognitive-behavioral interventions that address social cognition by implementing a CBT intervention with adults with HFASD. Participants were assigned to either a treatment group that concentrated on emotion training, problem solving, and perspective taking; or a control group that received treatment as usual (e.g. individual therapy, job skills coaching). The authors found significant main effects pre-post between the treatment and control groups on emotion recognition $F(1,8) = 10.02, p < .05$; and time comparisons for the treatment group on making inferences $F(1,9) = 10.02, p < .05$. The authors surmised that “improvements in social thinking may lead to improvements in social behavior” (p.1782).

In an effort to examine individual and group CBT interventions, Bauminger (2007a, 2007 b) implemented two studies that used CBT to improve the perspective taking, emotional understanding and recognition, and social problem solving in nineteen children with HFASD aged 7-11 during social interactions with peers. During the first study, the researcher met individually with each participant on a weekly basis over seven months. The goals of each session were to teach interpretation of social cues,

comprehension of emotions, understanding the perspectives of others, and social problem solving. The CBT intervention focused on interpersonal social problem solving as well as affective education to connect social behavior to emotions in self and others. To evaluate the children's improved social interactions, the author observed them with an assigned typically developing peer in natural settings, such as recess. The author reported significant increases across repeated measures in positive social interactions $F(1,18) = 5.72, p < .05$; eye contact $F(1,18) = 5.63, p < .05$; sharing $F(1,18) = 4.20, p < .05$; cooperation $F(1,18) = 4.88, p < .05$; assertion $F(1,18) = 15.14, p < .001$; and relevant solutions $F(1,18) = 5.21, p < .05$. In addition, complex emotion recognition in self and others as well as emotion knowledge showed significant increases at $F(2,17) = 6.88, p < .01$ and $F(2,17) = 4.21, p < .05$ respectively.

Expanding on positive results, a second study tested the same intervention in a group setting with participants from the first study as well as new recruits. Bauminger (2007b) reported similar positive results over time for both groups regarding the development of social solutions ($p < .05$), recognition of complex emotions ($p < .0001$), and relevancy of emotion explanations ($p < .0001$). The two groups differed in cooperation, however, with the new recruits demonstrating slightly better results over time than the original group on cooperation ($p < .0001$ and $p < .05$ respectively). Furthermore, all of the participants "revealed a better understanding of others ... and improved awareness of others" (p.1611). However, the results did not show generalization improvements to natural social interactions as did the first study. The author attributed this difference to the introduction of spontaneous peer interactions in the second study as compared to the assignment of a peer in the first. The author concluded

that the results support the use of interventions to improve reciprocal social interactions for children with HFASD.

Social problem solving research. A study conducted by Solomon, Goodlin-Jones, and Anders (2004) targeted emotion recognition, interpersonal skills, and social problem solving skills through role plays of communication situations. This study used a group CBT approach as well as a parent educational component. The authors also embedded socialization opportunities within the CBT training sessions so the participants could demonstrate newly acquired skills in both natural and role play situations. The study reported significant increases in social cognitive flexibility and inferential thinking for children and adolescents with HFASD at post-intervention. Furthermore, Solomon and colleagues (2004) indicated significant growth in realistic, social problem solving skills as well as social and interpersonal skills for the children with HFASD, indicating the possible beneficial aspects of using a cognitive-behavioral intervention to attend to social problem solving skills.

***Social Thinking* research.** Winner (2007) has reported applying the CBT approach to improve the social communication deficits associated with HFASD in empirical studies. Three studies have been reported using the *Social Thinking* (Winner, 2007) CBT intervention to evaluate: (a) the impact of social behavior mapping on increasing expected behaviors in children with HFASD (Crooke, Hendrix & Rachman, 2008), (b) the use of bridging comments to increase communication fluency in adolescents with HFASD (Garris, 2007), and (c) the effect of a social communication skill intervention on improving the social reciprocity of an adolescent with HFASD (Clavenna-Deane, 2010).

Crooke, Hendrix and Rachman (2008) obtained significant increases in expected behaviors and reciprocal social communication interactions for children with HFASD after using social behavior mapping and training on appropriate verbal and non-verbal communication. The participants increased their positive initiations of social interactions as well as responded more often with on-topic remarks and supportive one-word comments during interactions. Furthermore, participants used fewer unexpected verbal actions such as rude remarks, perseverative topics, off-topic comments, self-talking, and yelling. The authors surmised that the CBT embedded within the social behavior mapping resulted in positive behavioral changes in reciprocal social settings.

Garris (2007) used CBT to increase the communication fluency for adolescents with HFASD. The study investigated whether bridging comments/questions as logical conversation segues would increase topic maintenance and shared interest between the participant with HFASD and a conversation partner. During baseline, the author observed the participants in their home settings having conversations with their parents. The frequency of bridging comments or questions use was recorded as well as the participant's preference of the topic being discussed. The study moved to a practice phase, where the author provided the participants with descriptions of bridging comments and examples of ones that related to topics of interest. The author then trained the participants on how to use bridges to maintain these topics of interest. After the practice phase reached criterion for improvement and the participants moved into intervention phase, the author became the conversation partner. Results indicated significant increases in topic maintenance and shared interest for each of the two participants during practice as well as intervention phases. In addition, the results demonstrated that the skills

generalized from the practice phase with parents to the intervention phase with the researcher.

Clavenna-Deane (2010) conducted a preliminary examination of the intervention used in the current study to determine its effectiveness on improving the social reciprocity of an adolescent male with HFASD. The author evaluated three social communication skills: (a) initiating a conversation, (b) maintaining the flow of a conversation, and (c) addressing lulls in the conversation. Initiating a conversation required establishing physical presence, making eye contact, and engaging the conversation partner with a comment or question. Maintaining flow in the conversation was recorded each time a supportive comment, supportive question, or follow-up question was used. A lull in the conversation (defined as a pause of 3 seconds or more) was successfully addressed when the participant made a bridging comment or question that logically segued the conversation and reengaged the partner. As well, a lull could have been addressed by changing the subject to the object in the direction of the partner's eye gaze or by appropriately ending the conversation.

A multiple baseline design across the three social communication skills was used. The author taught the social communication skills using conversation supported language and social behavior mapping activities from the *Social Thinking* curriculum. Role plays, discussions, and paper pencil activities were used during the activities. The participant was observed in conversations with a peer and an adult and the frequency of skill usage was recorded for each conversation. The results indicated significant growth in all three skills: (a) initiating a conversation, (b) maintaining flow in a conversation, and (c) responding to lulls in a conversation. Significant gains occurred in the results for all

three skills with mean increases reaching above the 80% improvement over baseline criterion. It was noted that the participant used supportive comments most often for the second skill, maintaining flow in a conversation. During the third skill, he used bridging comments and questions most often to address lulls in a conversation. The results indicated improvement in reciprocal social interactions for the participant and provided the researcher with results that informed the current study's use of CBT social communication intervention.

Emerging uses of cognitive-behavioral therapy with children with HFASD have been identified throughout this review, however, further research is warranted. CBT has netted positive gains with children with HFASD as evidenced through Bauminger (2007a, b) and Gevers and colleagues' (2006) results. As well, beneficial gains have been achieved using CBT with adults with HFASD according to Turner-Brown and colleagues' (2008) results. Preliminary research on elements of the *Social Thinking* curriculum, which incorporates CBT throughout, have also shown positive gains in social communication skills for children and adolescents with HFASD. A limited amount of research has been conducted, though, using CBT to improve the social communication skills of individuals with HFASD. This study intends to expand this emerging research base and provide a thoughtful examination of the use of components of *Social Thinking* as well as CBT to improve social communication skills of adolescents with HFASD in school and employment settings.

Purpose of Study

The purpose of this study was to evaluate the effectiveness of a cognitive behavioral social communication intervention that incorporated social cognition and

problem solving to improve the reciprocal social interactions of adolescents with HFASD. The expected outcome was that participants would use the intervention to engage in productive, socially appropriate, and reciprocal conversations in a controlled (analogue) setting and then generalize the skills to an employment setting. The intervention used the following components: (a) conversation supportive language, (b) social behavior mapping; (c) peer model role plays, and (d) review and feedback sessions to answer these research questions:

- (1) Will social problem solving and social cognitive interventions derived from the *Social Thinking* curriculum improve the reciprocal social interactions of adolescents with HFASD in a controlled setting?
- (2) Will the reciprocal social interaction skills generalize to an employment setting?
- (3) Will the employers' ratings of overall employability skills increase as a result of the intervention?
- (4) How will participants and school personnel evaluate the effectiveness of the intervention?

CHAPTER THREE

Methodology

This study utilized a multiple baseline design across three communication skills: supportive comments, follow-up questions, and bridging comments or questions. The multiple baseline across skills design was employed to provide targeted measurement of the intervention. Additionally, generalization probes in employment settings occurred in tandem with analogue data collection. The analogue data provided the criterion for movement from baseline to intervention. Horner and colleagues' (2005) quality indicators of empirical structure in single subject design research guided the design of this study, thereby allowing for the attainment of evidence-based research.

Participants

The four high school students with HFASD who participated in this study were involved in part-time employment settings (paid or volunteer) as part of their high school curriculum. At the time of this study, two students were 20 years old, one was 19, and one was 18. The presence of HFASD was identified through verification from the Individualized Education Plan (IEP) of either a diagnosis of AS, HFA, or PDD-NOS as well as through confirmatory scores on the *Asperger Syndrome Diagnostic Scale* (Myles, Jones-Bock, & Simpson, 2001). Three participants were male and one was female. Two of the students' IEPs confirmed a diagnosis of High Functioning Autism; while one participant was diagnosed with Pervasive Development Disorder-Not Otherwise Specified; and the fourth with Asperger Syndrome.

Sampling measurements. The Asperger Syndrome Diagnostic Scale (ASDS; Myles, Jones-Bock, & Simpson, 2001), the Double Interview Assessment (Winner, 2007), and The Reading the Mind in the Eyes (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb 2001) were

completed during baseline to produce detailed sampling information regarding each participant's HFASD characteristics as well as their abilities regarding perspective taking and theory of mind. Having a precise understanding of each participant's abilities in these areas before beginning the study was critical to appropriately structure the instruction to the needs and ability levels of each participant.

Asperger Syndrome Diagnostic Scale (ASDS). The ASDS (Myles, Jones-Bock, & Simpson, 2001) provides a diagnostic determination of the characteristics associated with HFASD, including Asperger Syndrome. Five subcategories constitute the ASDS: Language, Social, Maladaptive, Cognitive, and Sensorimotor. The language subcategory evaluates verbal, nonverbal, literal and figurative language interpretation. The social subcategory assesses social reciprocity, perspective taking, and understanding of social cues. Ritualistic behaviors, responses to routine changes, and anxiety are evaluated in the maladaptive subcategory. Visual memory, intelligence level, and rote memory are assessed in the cognitive subcategory. The sensorimotor subcategory addressed possible sensitivities related to the individual's five senses. The ASDS was used to identify the participants' relative strengths and weaknesses compared to a normative sample of individuals with AS. High percentile scores in these subcategories indicated characteristics associated with AS.

The total score from the ASDS subcategories produced a standard score that was then translated into the Asperger Syndrome Quotient (ASQ). From the ASQ, a diagnostic determination can be made regarding the likelihood of a diagnosis of Asperger Syndrome. An ASQ of 111 or greater is highly indicative of AS, and an ASQ of 90-110 suggests a high probability of the presence of AS. A score of 89 or below indicates that the participant likely does not have AS. The overall internal consistency for this scale was .83, and the internal

consistency of the individual subscales ranged from .64 - .84. Given that the characteristics associated with AS are comparable to HFASD, the ASDS provided a gauge of the participants' HFASD characteristics and a corresponding direction for intervention plans. The ASDS was completed by each of the participant's transition coordinator.

The Double Interview Assessment. The Double Interview Assessment from the Social Thinking Dynamic Assessment Protocol (Winner, 2007) qualitatively measures perspective taking by evaluating facial expression recognition, interpretation of contextual cues, and inferential thinking. This assessment consists of three parts: (a) an interview of the participant, (b) a picture identification task, and (c) an interview of the researcher by the participant. First, the interviewer asks questions regarding the participant's interests, social relationships, and awareness of the people they live with. During the picture identification task, the researcher shows the participants pictures related to his or her personal life. For this study, the researcher showed three pictures. The participants were asked to identify the people and settings in each picture and interpret their feelings. The participant is also asked to create questions about the pictures and settings. During the third phase of the study, the participant was instructed to ask the researcher questions in order to get to know her better. If the participant was unable to formulate questions, the researcher followed a three step routine. First, the researcher referred the participant back to the pictures to provide cues for further questions. Next, the researcher drew four boxes on paper while asking the participant to fill each of them with a question, and then she explained that the interview would cease after the four boxes were filled. Last, the researcher told the participant that he or she could ask the same questions the researcher had asked when interviewing the participant. These steps were applied to each participant if he or she was having difficulty formulating questions.

According to Winner (2007) the picture identification task and the interview of the researcher is designed to evaluate participants' ability to:

shift perspective from thinking about themselves to thinking about others; organize their thoughts and then verbalize them in a way that moves in a purposeful direction in conversation with another person; and formulate questions and using [sic] follow up questions to explore another person's thoughts and/or interests (p. 225).

While still considered informal, preliminary research has been conducted to determine the feasibility of the assessment. Zweber (2002) administered the Double Interview to adolescents with HFASD and a matching number of typically developing adolescents to compare the social communication differences between the two groups, and to determine the assessment's accuracy of identifying deficits in social communication for individuals with HFASD. The results indicated that the Double Interview accurately identified the social communication challenges associated with HFASD (e.g. shifting perspectives from self to others, interpreting social cues, formulating thoughtful questions and responses).

In the present study, the Double Interview provided data that identified the participant's level of perspective taking ability (i.e. Impaired Interactive Perspective Takers [IIPT] or Emerging Perspective Takers [EPT]). Individuals with IIPT are considered to be aware that others have different perspectives from their own and understand the intent behind social cues. They are also keenly aware of their own differences in social settings, but "fall short when it becomes necessary to monitor and modify their own behavior during a spontaneous conversation" (Winner, 2007, p.9). Subtle changes in facial expressions, body language, and voice tone are often difficult for the IIPT to interpret and respond to during a conversation. They may become overwhelmed by such social executive challenges and lack the ability to consider

their conversation partner's points of view. As a result, they often digress during conversations and focus only on their own topics of interest, rather than considering those of the conversation partner. Their deficits in perspective taking are subtle, and they "often look 'normal' ... [therefore] peers and adults expect them to successfully interact with others in a positive and productive way" (Winner, 2007, p. 9). However, an individual with IIPT requires cognitive instruction that repeatedly analyzes both the behavior of him or herself and others and supports his or her conversational skills.

An Emerging Perspective Taker (EPT) similarly struggles with concepts related to the perspectives of others during a conversation. However, his or her perspective taking deficits are more apparent. An individual with EPT has difficulty understanding the "abstract qualities of perspective taking, such as ... people's motives or exploring emotions and language in context" (Winner, 2007, p.6). Consequently, social cues, such as shifting eye gaze, and turning away from the speaker remain unnoticed by the individual with EPT. Furthermore, an individual with EPT may use either a loud, demanding tone of voice with frequent interruptions, or a monotone, tone of voice with little eye contact or facial expressions. They are unable to perceive how these social behaviors reduce the reciprocity of the conversation. An individual with EPT benefits most from direct and intensive instruction of social communication skills, combining cognitive and behavioral strategies.

The Reading the Mind in the Eyes. The Reading the Mind in the Eyes test (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb 2001) was used to provide sampling descriptions of each participant's Theory of Mind capabilities. The Reading the Mind in the Eyes (RMIE) reliably measures social sensitivity and how well a participant can put "themselves into the mind of another person and 'tune in' to their mental state" (p. 241) by considering facial expressions

and emotions expressed in other's eyes. During the test 36 pictures of the eye area are presented. The assessor asks "which word best describes how this person is feeling?" The participant, then, chooses between the four emotions.

The RMIE's accuracy in indicating theory of mind deficits was tested with individuals with HFASD and those from the general population. The typically developing adults produced a mean of 26 with a standard deviation of 3.3; undergraduate students scored a mean of 28 with a standard deviation of 3.5; and the young adults with HFASD scored a mean of 22 with a standard deviation of 6.6 (Baron-Cohen, et al., 2001). A correlation of the RMIE with Baron-Cohen and colleagues (2001) Autism Spectrum Quotient resulted in a significant relationship, indicating that a greater presence of autism spectrum characteristics was related to deficits in theory of mind characteristics (Baron-Cohen, Wheelwright, Skinner, Martin, and Clubley, 2001). In the present study, participant results on the RMIE were compared to the means for typically developing adults as well as the individuals with HFASD to demonstrate their individual disparities from the general population of adults as well as their similarities to individuals with HFASD.

Participant Characteristics. The four participants in this study had unique interests and goals. They all had identifiable HFASD characteristics yet individual strengths and areas of need in social and communication skills. It was important to have specific knowledge of each participant to tailor the social communication instruction appropriately. The descriptions incorporated the researcher's observations of the participants as well as their results on the sampling measurements. Table 1 outlines the results from the three sampling measurements.

Table 1.

Sampling Measurements Results.

Measurement	Brett	Misty	Steven	Alan
ASDS *	97	120	116	92
Language	11	15	9	9
Social	9	12	13	9
Maladaptive	10	6	13	9
Cognitive	6	9	13	11
Sensorimotor	4	16	13	6
RMIE	13**	12**	22***	28
Double Interview	EPT	EPT	EPT	IIPT

Table 1. Note: The (*) indicates that the ASDS results are actually represented as the Asperger Syndrome Quotient, which is the total score for all subcategories. The (**) represents a score on the RMIE that is significantly below the mean for typically developing adults and the mean for individuals with HFASD. The (***) indicates a score on the RMIE similar to the mean for individuals with HFASD.

Brett. Brett was a pleasant young man with a high interest in the local university's athletic teams. In fact, he would focus many of his conversation topics on this restrictive interest. He enjoyed playing sports and spending time with his family. He was planning to transition to the school district's community based 18-21 year old program to extend his employment and independent living experiences. Brett expressed interest in working at the local university's food service department as an adult. He also planned to live in a semi-independent living apartment.

Brett's results from the sampling assessments supported his diagnosis of High Functioning Autism. His ASDS results indicated an ASQ of 97, which placed him in the high probability of AS range. His subcategory scores were: language (63rd percentile), social (63rd percentile), maladaptive (50th percentile), and sensorimotor (37th percentile). The results of the

Double Interview Assessment indicated he was an Emerging Perspective Taker. In the first part of the Double Interview, Brett provided answers regarding his interests, but when asked about his mother or father's spare time interests, he was unable to produce any answers. During the picture identification task, Brett recognized that the people in the pictures looked happy; but he did not recognize that the researcher was with her family in the pictures. He asked the researcher who the children were but did not understand they were hers until she told him. In the third part of the interview, Brett required the four box prompt to ask his questions. He asked the researcher "what do you do?" When she answered that she liked to spend time with her kids and work at the local university, he diverted the next three questions to his interest in the local university's basketball team. The researcher looked around the room during these questions and provided short, shallow answers to demonstrate her lack of interest, but Brett continued to ask further questions or became silent. The researcher then suggested that he could ask any of the questions that the researcher had asked him, but he said he was finished. The researcher spoke with Brett after the interview to assess whether he recognized the cues the researcher was giving (shifting eye gaze, short answers), he indicated he did not notice these cues.

Last, Brett's score of 13 on the RMIE was significantly below the mean for both typically developing adults mean and individuals with HFASD. The researcher used Brett's results from the three assessments: the Double Interview, the ASDS, and the RMIE to inform instructional practices. Concrete application as well as direct and intensive instruction were identified as critical for Brett to improve his social communication skills.

Misty. Misty was an intriguing young woman with a high interest in children's toys, movies, and activities. She also enjoyed drawing and composing music. Misty was planning to transition to the school district's community based 18-21 year old program. Misty wanted to

work for short periods of time with either children or elderly people, while continuing to live at home with her family.

The results of the ASDS indicated that Misty's ASQ of 120 was highly indicative of AS. Her sensorimotor, language, and social subcategory percentile scores (98th, 95th, and 75th respectively) identified significant weaknesses in these HFASD characteristics. Additionally, on the Double Interview, Misty demonstrated characteristics associated with an Emerging Perspective Taker. During the first part of the interview, when the researcher asked about her parents' interests, Misty focused on their divorce ten years prior and her sadness about their divorce. She then asked the researcher if she and her husband were divorced and if her children would be upset if their parents were divorced. During the picture identification section, she made statements like "your son is about 2 and your other son is about 6," and asked diverted topic questions that related to her interest in baby items and children's toys, such as "does your little boy wear diapers." During the researcher interview, she continued with comments or questions about babies even after the researcher explained that the picture was an old one and the children were much older now. Misty responded to this redirection by interrupting the researcher in a loud, demanding tone saying, "I just don't want to talk about their ages now. I was talking about them when they were babies." She regularly turned her body and eyes away from the researcher while continuing to talk. When the researcher indicated that Misty could ask similar questions as those the researcher had asked her, Misty declined the opportunity stating she was tired and wanted to end the interview. Her repeated diversion to her interests, the overfocus on her feelings, and her difficulties with displaying and interpreting social cues and body language indicated her Emerging Perspective Taker level.

Misty scored a 12 on the RMIE, which was far below the mean scores for typically developing adults as well as individuals with HFASD. The researcher used Misty's scores on the three assessments to consider appropriate instruction practices. Misty needed regular concrete, hands-on application of the social communication skills. In addition, Misty required visual representations of her body language and voice tone to recognize the need to change them.

Steven. Steven was a quiet young man who enjoyed playing computer and video games as well as watching horror movies. He preferred to work alone on most projects. Steven's transition plans included moving to the the school district's community-based 18-21 year old program. Steven had expressed interest in working at a funeral home as an adult. In addition, he wanted to live with his family for a few years and then move into a semi-independent living situation with a peer with HFASD.

Steven's ASQ of 116 was highly indicative of AS. Steven's social, maladaptive, cognitive, and sensorimotor subcategories were all at the 84th percentile, signifying high levels of weakness for him relative to these HFASD characteristics. During the first part of Steven's Double Interview when asked about his hobbies and interests, he provided cursory one to three word answers using a monotone voice. He was unable to formulate any ideas about his family's interests, thereby demonstrating limited awareness of those with whom he lived. During the picture identification section, he asked if the beach setting in the picture was the same as a watercolor picture of a beach on the wall in the room. He did not ask the researcher any questions about her interests. When prompted, he commented that the children looked happy in the picture. The researcher presented the four boxes, but Steven refused stating he didn't have any questions. The researcher then referred to the interview questions she had asked, but he continued to refuse to ask any questions. During most of the interview, Steven avoided eye

contact with the researcher. Instead, he looked at the floor or his hands. His lack of awareness of the people he lived with, his diversion to the unrelated topic of the picture on the wall, his inability to formulate questions for the researcher, and his significant body language expressions and monotone voice were indicative of someone with significant social communication and perspective taking deficits. Therefore, the researcher determined that Steven was an Emerging Perspective Taker.

Steven's score on the RMIE was 22, which was below typically developing adults and similar to the score for individuals with HFASD. The researcher used Steven's results from the three assessments: the Double Interview, the ASDS, and the RMIE to inform instructional practices. It was determined that Steven needed concrete application as well as discussion activities to improve his social communication skills.

Alan. Alan was an affable young man who enjoyed running, playing sports, and spending time with individuals with disabilities given his career goal to be a special educator. Alan indicated he had been accepted to a state university and planned to major in special education. He wanted to live on campus with a roommate in an apartment setting instead of a dorm room to allow for privacy. He stated that he is considering not disclosing his Asperger Syndrome as he believed it would not impact him in college like it had in high school.

Alan's ASQ on the ASDS was 92, which placed him within the range of a high probability for AS. His maladaptive, language, and social subcategory scores were each at the 37th percentile. His cognitive subcategory score was at the 63rd percentile, indicating strengths in rote and visual memory as well as above average intelligence, yet mild to moderate challenges with interpreting non-verbal and figurative language as well as comprehending subtle social cues. Alan's Double Interview results indicated he was an Impaired Interactive Perspective

Taker. He was able to list his own interests as well as cursory details about his family's interests. He could formulate questions during the picture identification section that demonstrated interest in the researcher, such as, "That vacation spot looks nice. I bet you enjoy going there?" As well, he asked occasional follow-up questions and supportive comments, such as "Do you get to go there often?" and "Your children and husband look like they enjoy the vacation as well." He made regular eye contact with the researcher and used formal yet appropriate facial expressions during the first half of the interview. However, when he was prompted to ask four questions related to the researcher's interests, he focused three questions on Asperger Syndrome, an area of interest to him. He asked one question about the researcher's hobbies, but, he did not ask any follow-up questions when she answered. When later asked why he chose those questions to ask, he stated that he wanted to learn more about AS and believed the researcher would have information for him. He demonstrated the capability of interpreting others emotions and perspectives by his thoughtful questions about the pictures, yet his quick diversion to his personal interest was indicative of challenges with analyzing the perspectives of others during a reciprocal interaction. The researcher answered the last question with a short response to assess whether Alan would ask a related question, but he paused and asked another question about AS. In addition, when the researcher answered his questions, he added lengthy comments about AS to either corroborate or dispute the researcher's answers. In subsequent conversations with Alan, he admitted that he had difficulty interpreting body language and social cues.

On the RMIE, Alan scored a 28, which was comparable to the mean score for the undergraduate student group. The researcher used Alan's results from the three assessments: the Double Interview, the ASDS, and the RMIE to inform instructional practices. It was determined that Alan's instruction would consist mostly of discussion activities where the researcher would

bring up social situations and together they would discuss the reasons for the use of different social and communication skills, as well as the application of the skills and analyze the benefits of using these skills in the role play situations.

Peer Models. To assist with the practical instruction during the intervention, peer models without disabilities were recruited to act as conversation partners in the analogue setting. Three typically-developing peer models were recruited: two from the high school and one from the local university. The peer models at the high school were both 17-year-old females who shared classes with Alan. The peer model from the university was a 20-year-old female, who participated as the model with Brett, Misty and Steven.

Coworkers in the employment setting not associated with the training were the conversation partners for the generalized settings. Human subjects' approval from the University of Kansas was received, and the participating school district provided formal study participation approval prior to contacting the participants. Parental consent as well as assent from the underage participants was received for participants both with and without HFASD under the age of 18 as well as those whose parents had retained legal guardianship past the age of majority. The teachers and transition coordinators conducted the recruitment of the participants with HFASD and the peer models, completed the ASDS diagnostic assessment, and participated in social validity interviews.

Peer model training. During a one-hour session prior to baseline, the three peer models learned about the study, the core components of the three target skills, and their roles as a conversation partner during the intervention. The peers did not have access to any private diagnostic information or assessment results regarding the participants with HFASD. However, they were informed of the general characteristics of individuals with HFASD and the purpose of

the study. Video clips of modeled conversations using the conversational components: (a) supporting comments, (b) follow-up questions, and (c) bridging comments and questions were shown. In addition, non-verbal communication cues that they were required to exhibit during the role plays and/or analogue conversations were demonstrated (e.g. eye gaze shifts and body movements towards and away from the partner). The peers were also trained to respond to the use of the three skills, such as answering follow-up questions, or changing the subject when prompted by a bridging comment or question.

Setting

Analogue. The intervention took place in the participants' special education classroom at a Midwestern, suburban high school. The special education classroom also provided the analogue setting for the data collection of the conversations with peer models. Training on component features of the intervention occurred approximately twice a week for 20 minutes. Conversations with the peer models during analogue data collection occurred once or twice a week for 10 minutes. Alan conversed with peer models once a week throughout the study with the exception of one week when he had two conversations; Brett had three weeks of the study where two conversations were recorded per week; Steven had four weeks of the study with two conversations recorded per week; and Misty had six weeks of the study with two conversations recorded. A unique component of this study was the generalization probes that occurred once a week in each participant's employment setting, which were custodian at an aquatic center, dishwasher at a restaurant, custodian at a thrift store, mail deliverer at a retirement center, and teacher's assistant in a special education classroom.

Ecological inventory of employment sites. Prior to collecting baseline data in the generalization setting, an ecological inventory of the job site was conducted. The researcher

made two site-specific observations to determine ideal times for socialization opportunities as well as appropriate observational times. The researcher asked the participants, employers, coworkers, and school staff about scheduled break times, joint work activities, and weekly lunches or parties that fostered socialization. In addition, the researcher observed unstructured socialization activities such as unscheduled break times, random conversations between coworkers and participants, and joint work activities. Each employer provided permission for observations to occur at the job site. Since the data collection was only on the participant, individual permission from each person with whom the participant conversed was not necessary.

Employment Sites. Each of the employment sites was unique with regards to job duties and opportunities for socialization. Table 2 describes the participants' job sites, their job duties, and the average amount of socialization opportunities that each job site allowed.

Brett changed jobs midway through the study. His first employment site, a custodial position at a local aquatic center, had the least amount of socialization opportunities. There was only one other employee working as the receptionist in the same location as Brett, and their interaction time was very limited. He only had an opportunity to converse at the beginning of his work time or at transition times in between job activities. Brett was independent on his job tasks, and the researcher chose to collect data at the beginning of his job and at one transitional time. He ended this job six weeks into the study.

For his second job site, Brett worked in a restaurant washing dishes, preparing the restaurant for lunch, and cleaning the dish room work area. He worked two days a week with a job coach. The restaurant manager was unwilling to allow the researcher in the restaurant to observe Brett, so the transition counselor video recorded Brett during his time at work, which provided recordings for data collection. He began this job nine weeks into the study.

Table 2.

Participant Employment Sites, Duties, and Socialization Opportunities.

Participant	Brett Job 1	Brett Job 2	Steven	Misty	Alan
Employment Site	Custodian at Aquatic Center	Kitchen Help at a local restaurant	Custodian at Thrift Store	Mail Delivery at Retirement Center	Teacher's Assistant in Special Education Classroom
Time on Job	2 hours	2 hours	1 hour	2 hours	1 ½ to 2 hours
Job Duties	Wash windows, Vacuum, Sweep and mop entry.	Take down chairs, Wash dishes, Sweep, Mop.	Wash windows, Wash dishes, Vacuum, Straighten store items.	Sort mail by resident name, Deliver mail to each resident, Converse with each resident, General custodial in cafeteria.	Guide completion of group projects. Create group activities, Problem solve behavioral situations.
% of Socialization	20% of work time	40% of work time	40% of work time.	75% of work time	Over 80% of work time

Steven worked as a custodian at a local thrift store. His opportunity to talk to his job coach during joint work activities was limited as the job coach was fading instruction in order to increase Steven's independence. However, he had a few coworkers with whom he interacted at the beginning and end of his job shift. The researcher chose to observe conversations during the last thirty minutes of his job.

Misty and Alan had the most opportunities to socialize due to the nature of their employment. Misty had multiple joint work activities with her job coach and coworkers throughout her mail delivery and custodial work time at a local retirement home. She also interacted with residents as she delivered their mail. The researcher chose to collect data during

her mail delivery. Alan interacted with various people as a teacher's assistant in a special education classroom. He led small group activities and assisted the peers with disabilities to complete assignments. At the beginning and end of class, and during unstructured times, Alan was able to socialize with his peers as well as formally interact with the adults in the classroom. The researcher collected data from the beginning of class through the first thirty minutes.

Intervention

The intervention consisted of four components. The four components combined social cognitive training, skill based training, and peer modeling training. The first two components were derived from the *Social Thinking* (Winner, 2007) curriculum (i.e. conversation supportive language and social behavior mapping) and addressed social cognition as well as training in the three target skills. The third component used peer models to role play behaviors with the participants. Finally, the review and feedback sessions provided a self-evaluation opportunity to each conversation, which reinforced the social cognitive restructuring. Each of the intervention components was introduced and instructed across eight weeks of lessons, with each component represented during each week of lessons. The lessons focused on visual, auditory, kinesthetic, experiential, and performance based learning styles. Activities typically included paper pencil tasks, discussion topics, role plays of conversational skills, and demonstration of proper and improper ways of communicating. In addition, the participants viewed differences in reactions from self and others and evaluated their real-life experiences with feedback. Sample lessons are included in Appendix A. The lessons followed a consistent order: conversation supportive language activities, role plays with peer models, social behavior mapping, and review and feedback sessions.

Conversation Supportive Language. Conversation supportive language is designed to anchor the participant's thoughts on his or her communicative partner as a means to increase perspective-taking ability as well as reciprocal conversational skills. Winner's (2007) four steps of communication provided the structure for this component:

1. Step one teaches the student to think about the thoughts and feelings of the people with whom he or she wishes to communicate,
2. step two instructs the student on how to establish a comfortable physical presence that indicates communicative intent,
3. step three teaches maintaining eye contact towards the communication partner to seal the communicative intent, and
4. step four focuses on using supportive language to maintain equity during the conversation (Winner, 2007, p. 33).

The "Four Steps of Communication" worksheet (Appendix B, Winner, 2005b) provided questions and directions on how to anchor thoughts toward the conversation partner. The researcher included examples from baseline conversations to illustrate the instructions in the worksheet. Four steps activities trained the participants on how to use conversation supported language and the three communication skills (i.e. supportive comments, follow-up questions, or bridging comments or questions). For example, in step one, the researcher instructed the participant to think of conversational topics in which the peer models and coworkers were interested. Then, the researcher instructed the participant to use supportive comments that demonstrated the participant had listened to the partner's interests. Conversation supportive language required the participant to think about his or her partner's interests and demonstrate skills supporting such consideration.

Role plays with models. Role play activities were embedded within the conversation supportive language activities. The university peer model, who worked with three of the participants assisted with practicing the target skill. For example, when establishing a physical presence was introduced, the peer model demonstrated examples of appropriate as well as inappropriate body language. For Alan, the researcher assumed the role of the peer model. During the role plays, participants also exhibited appropriate and inappropriate examples of the conversation supported language activities. Role playing activities provided the participants with a visual model of the expected behavior.

Social behavior mapping. The social behavior mapping (SBM) component derived from the *Social Thinking* curriculum (Winner, 2007, Appendix C). The SBM sequence provided a visual structure for problem solving that participants could apply to multiple settings. An SBM is used to first define context-specific behaviors as either expected or unexpected and then to identify the feelings and consequences of both the participant and conversation partner as a result of the behavior. According to Winner (2007), expected and unexpected behaviors “affect the emotional state of those who are in close proximity...[and]consequences occur not because of the behaviors, but from the impact of these behaviors on other’s emotional states” (p.154). SBM teaches problem solving skills focused on the emotional states, perspectives, and actions of others. It also cognitively reconstructs the context and setting as a means to reframe one’s actions for future conversations. Finally, the SBM is used as a visual reference for the participant to clarify their actions and the consequential feelings (Winner, 2007).

During the first lesson of the intervention phase, the researcher introduced a completed SBM, evaluating the context working in a small group. An example of this SBM is provided in Appendix C. The completed SBM provided a visual representation of the steps involved in the

SBM process and provided examples of skill usage. Some of the SBM expected behaviors for working in a small group associated with the first skill, supportive comments, were “contribute to the group by figuring out the topic of discussion”, and “monitor your talking so others can contribute” (Winner, 2005a, p. 48). Some of the unexpected behaviors were “dominating the conversation with your own ideas,” and “being the rule police” (Winner, 2005a, p. 49). In subsequent lessons, the researcher and the participant completed blank SBMs based on observed contexts from the participant’s analogue and employment settings and aligned the expected behaviors with the conversation skills. Some of the contexts completed for individual participants were who to sit with at lunch, free time activities on the job, initiating a new conversation with a person of the opposite sex, and following your supervisor’s directions.

Review and Feedback Sessions. The final component in the intervention was review and feedback sessions. The participants viewed video clips of their conversations with the peer models in the analogue setting, after which the researcher posed the following questions:

(a) What did you think of this conversation; (b) What went well and why; and (c) What was difficult and why? When a conversation was difficult, the expected and unexpected behaviors of the conversational setting were problem solved using an SBM. During the review and feedback sessions, the researcher, also, highlighted the participant’s use of the target communication skill, and identified areas of strength and recurring need.

Treatment fidelity. A checklist of the outlined activities associated with each lesson was used to assess fidelity (Appendix D). The researcher viewed the checklist before each lesson and completed it after each lesson. A graduate student blind to the study was asked to observe three sessions with three different participants during the intervention phase to determine the level of implementation consistency across participants. The graduate student checked off each item that

the researcher completed and compared the results across all three sessions to evaluate the consistency of the intervention. Treatment fidelity across all three sessions was 95%.

Data Collection and Analysis

Dependent variables and measures. Horner et al. (2005) recommended that the dependent variables in single subject design studies be operationally defined, valid, and measurable with inter-observer agreement at 80%. Having dependent variables that can be replicated by others in the field is critical for single case research to draw useful inferences from the results. This study's multiple baseline design collected observational data using a partial interval time sampling to indicate individual growth from baseline to intervention and in maintenance of the target skills. The target skills for conversational language improvement were (a) making supportive comments, (b) asking follow-up questions, and (c) using bridging comments or questions.

Skill 1: Making supportive comments. This skill required that the participant maintain a shared point of reference with the partner, listen to the partner's topics of interest, and develop responses related to the partner's topics. Supportive comments increased the mutual exchange of information in a conversation. Supportive comments could be verbal responses such as "Oh Yeah," or "Right!" or nonverbal responses such as head nodding.

Skill 2: Asking follow-up questions. This skill required that the participant develop follow-up questions that probed for more information about a partner-initiated topic of interest. Follow-up questions demonstrate perspective-taking by asking questions to learn more about the conversation partner, as well as show interest in the other person's topic. Follow-up questions commence with the partner-initiated topic and then follow-up with more in-depth questions

about the topic (e.g. “So you went to the Arch in St. Louis.” “What was it like?” “Did you get scared at any point?” “How did your friends feel about it?”).

Skill 3: Using bridging comments or questions. This skill introduced a new but related topic to the conversation (e.g. “You went to the Arch. I’ve been to the Washington Monument”). Bridging comments or questions are designed to move the conversation toward a topic of interest to the participant while still showing interest in the speaker’s topic (Winner, 2007). Bridging also taught the participant useful ways to subtly change the subject in the event that a conversational lull occurred.

Observation checklist. An observation checklist was developed to measure the three social communication skills: (a) supportive comments, (b) follow-up questions, and (c) bridging comments or questions (Appendix E). Partial interval recording was used to measure the occurrence or non-occurrence of the skill in ten-second intervals over eight-minute observational periods during the analogue data collection. In other words, if the skill was observed at “any time within the specific time interval, the interval is scored as an occurrence of the stimulus...if the same event occurs multiple times within the interval, it is still recorded as [one] occurrence” (Kennedy, 2005, p.102). If the skill was not observed during the interval, the interval was scored as a non-occurrence. A check mark represented an occurrence; a dash or empty space represented a non-occurrence. An eight minute conversation (the average length of the analogue conversations) had 48 possible intervals per target communication skill. The researcher totaled the number of interval checkmarks for each target skill, divided that score by 48, and calculated a skill usage percentage.

Generalization data. Generalization data occurred once a week during a 30-minute period in the employment setting throughout baseline and intervention phases. For consistency,

the researcher observed each natural conversation for 2 minutes. This decision was based on the results of the ecological inventory in determining an average amount of possible 2-minute conversations during a 30 minute visit. Brett's average was 3 at his first job and 4 at his second job; Steven's average number was 5; Alan's was 7; and Misty's was 10. Partial interval recording was during generalization probes in the employment settings.

Movement criterion from baseline to intervention. Movement from baseline data collection to each intervention phase was based on performance during the analogue setting. Baseline across all three skills occurred during Phase 1 of the study. When a consistent baseline trend for the first skill (supportive comments) was established, then intervention for that skill began. Baseline data collection continued for the other two skills during intervention for Skill 1. A criterion of 80% usage for three or more successive data points was established prior to data collection. During baseline, follow-up questions and bridging data were significantly low, with many scores below 10%. A separate criterion was then instituted for movement: visual inspection of three data points or more of sustained growth over baseline. This criterion continued for all intervention phases. Maintenance data were collected for supportive comments and follow-up questions, however the school year ended before bridging maintenance data could be collected.

Typically developing threshold. Midway through the study, the question surfaced regarding how often the targeted skills were used in natural conversations among adolescents and adults without disabilities. The researcher recorded four dyad conversations and one triad conversation between a convenience sample of typically developing individuals (i.e. teens, young adults, and adults) to establish a natural conversation mean of the target skills for comparison to the participants' skill usage. The researcher utilized the same data collection and

analysis procedures from the study for the conversations between typically developing adults, then compiled an overall mean score across the three skills. Mean results for supportive comments was 72%; follow-up questions was 19%; and bridging was 9%. These averages established the criterion for the typically developing threshold for participant skill comparison. As the threshold was developed after bridging intervention data was completed, it could not be used as a criterion for movement but only as a comparison.

Interobserver agreement. Observational data were collected during the analogue phase and video recorded for inter-observer agreement. Two researchers simultaneously recorded data. For Brett there were interobserver sessions for 20% of observations. For Misty, there were interobserver sessions for 15% of observations; and Alan and Steven had 13% of observations. The percentage of overlapping data between the two observers was recorded by dividing the number of agreed upon intervals by the total number of intervals possible in the conversation (e.g. 136 agreed upon intervals divided by 144 possible intervals). Interobserver agreement between the two recorders was 96%.

Interobserver agreement for the employment conversations was conducted in a similar manner. Five employment conversations (one for Misty, three for Brett, and one for Steven) were video recorded for interobserver agreement. Misty, Brett, and Steven's employers allowed the researcher to record one session given the disruption that would occur if two researchers were observing during the job setting. Alan worked in a special education classroom; due to the nature of the special education classes, the employer was concerned that that students in conversation with Alan would need consent for video recording. Unfortunately, the researcher was unable to receive recording consent from all the students, teachers, and other aides that Alan conversed with and was unable to record conversations for interobserver agreement purposes.

The same method of calculating interobserver agreement was used in the employment setting. Inter-observer agreement on the employment conversations was 97%.

Employability. Each employer or job coach was asked to rate the employability skills of the participant with HFASD. The rating scale focused on seven skills related to social interactions in the workplace and was adapted from the Work Personality Profile (Neath & Bolton, 2008; Appendix F). The employer or job coach was asked to rate the participant on listening skills, appropriate communication with coworkers and employers, and socialization with others. A seven-point Likert scale was used to rate each of the seven skills, with 7 as excellent, 4 as adequate, and 1 as significantly challenging. The employers or job coaches were asked to complete this rating scale once a week. However, due to personnel scheduling conflicts, the employers or job coaches were not able to complete one every week. Steven's job coach completed seven surveys with two being in the initial baseline phase; Misty's job coach completed eight surveys with one being in the initial baseline phase; Alan's employer completed seven surveys with one being at the beginning; and Brett's job coach completed two surveys for the first job and three surveys for the second job. The ratings were recorded to measure changes in employment social skills.

Social validity. Social validity determines the social importance of the dependent variable as well as the intervention (Horner, et al., 2005). It is considered the process in which participants and observers provide subjective evaluation regarding the appropriateness and effectiveness of the intervention (Kazdin, 1982). During the study, the researcher informally interviewed the participants as well as school personnel and employers and job coaches to collect anecdotal data on the effectiveness of the intervention. The researcher inquired about the specific intervention components as well as the dependent variables, and investigated the ease of training

acquisition and the usefulness of the activities. In addition, the informal interviews examined the participants' use of the intervention outside of the analogue setting data. The anecdotal results were analyzed and reviewed for emergent themes. Sample social validity questions are included in Appendix G.

Controls for internal and external validity. This study's intervention was scaffolded across three skills. The participants received the social cognition and problem-solving intervention only after the target skills reached internal consistency by demonstrating visual improvement over baseline for three or more data points. Any social skill interventions that were in existence prior to the current intervention were held constant throughout the training. The systematic replication of this intervention across four participants increased the strength of the functional relationship between the dependent and the independent variables (Horner et al., 2005; Kennedy, 2005). Finally meeting high quality standards for interrater reliability eliminated possible experimenter effects, and the quality controls for treatment fidelity established through the treatment fidelity checklist eliminated possible instrumentation effects.

CHAPTER FOUR

Results

This study investigated the use of a cognitive-behavioral social communication intervention to improve the reciprocal social interactions of adolescents with HFASD in school and employment settings. This chapter presents the results of this study. The findings are organized into four main sections: (a) analogue setting data, (b) employment setting data, (c) employability skills ratings, and (d) social validity.

Analogue Setting

In the analogue setting all four participants demonstrated increased usage of one or more of the targeted skills during intervention. Supportive comments growth occurred for all participants. Two participants increased their follow-up questions usage; the other two participants maintained usage similar to baseline. The results for bridging comments and questions, herein referred to as bridging, demonstrated improvement for three of the four participants with one participant maintaining usage similar to baseline.

Typically developing threshold. The typically developing threshold provided a comparison line on each data figure for social communication skill usage among non-disabled peers. The typically developing threshold mean usage for supportive comments was 72%, for follow-up questions 19%, and for bridging 9%. These averages were used for participant skill comparison not as a criterion for movement from baseline to intervention because the threshold was developed after data collection had ended.

Brett. Brett's baseline results for supportive comments revealed a 45% average use. During intervention, his mean use was 74%. His maintenance mean use of 65% sustained an increase over baseline. His baseline follow-up questions averaged 6%, and the intervention

average was 22%. During follow-up questions maintenance, he maintained a mean use of 11%. Brett's bridging use averaged 5% during baseline and improved to 10% during intervention. The school year ended before Brett could demonstrate maintenance for bridging comments and questions.

Brett's supportive comments data during intervention were at or above the typically developing threshold of 72%. Maintenance data showed four out of six data points (67%) were at or above the threshold. Data for follow-up questions averaged 33%, which was 14% above the typically developing threshold of 19%. All maintenance data for follow-up questions were slightly below the threshold. For bridging, Brett's average was 10% which was at the typically developing threshold of 9%. Figure 1 graphically represents Brett's analogue results.

Misty. Misty's average use of supportive comments increased from 46% in baseline to 79% in intervention. Her maintenance mean was 69%. Her baseline average for follow-up questions was 10%; and her intervention average increased to 17%. During maintenance, her scores regressed but gradually increased to a mean of 14%. Misty's baseline bridging mean was 7% and increased to 23% during intervention. The school year ended before Misty could demonstrate maintenance of bridging comments and questions.

Misty's intervention average for supportive comments (78%) was above the typically developing threshold of 72%. Her maintenance average (69%) was just below the typically developing mean. Her intervention mean for follow-up questions (17%) was just below the typically developing threshold of 19%. Her maintenance average (14%) was also below the threshold. Her intervention average for bridging (23%) was significantly higher than the typically developing threshold of 9%. No maintenance data were collected on bridging as the school year ended. Figure 2 graphically represents the Misty's analogue results.

Figure 2.

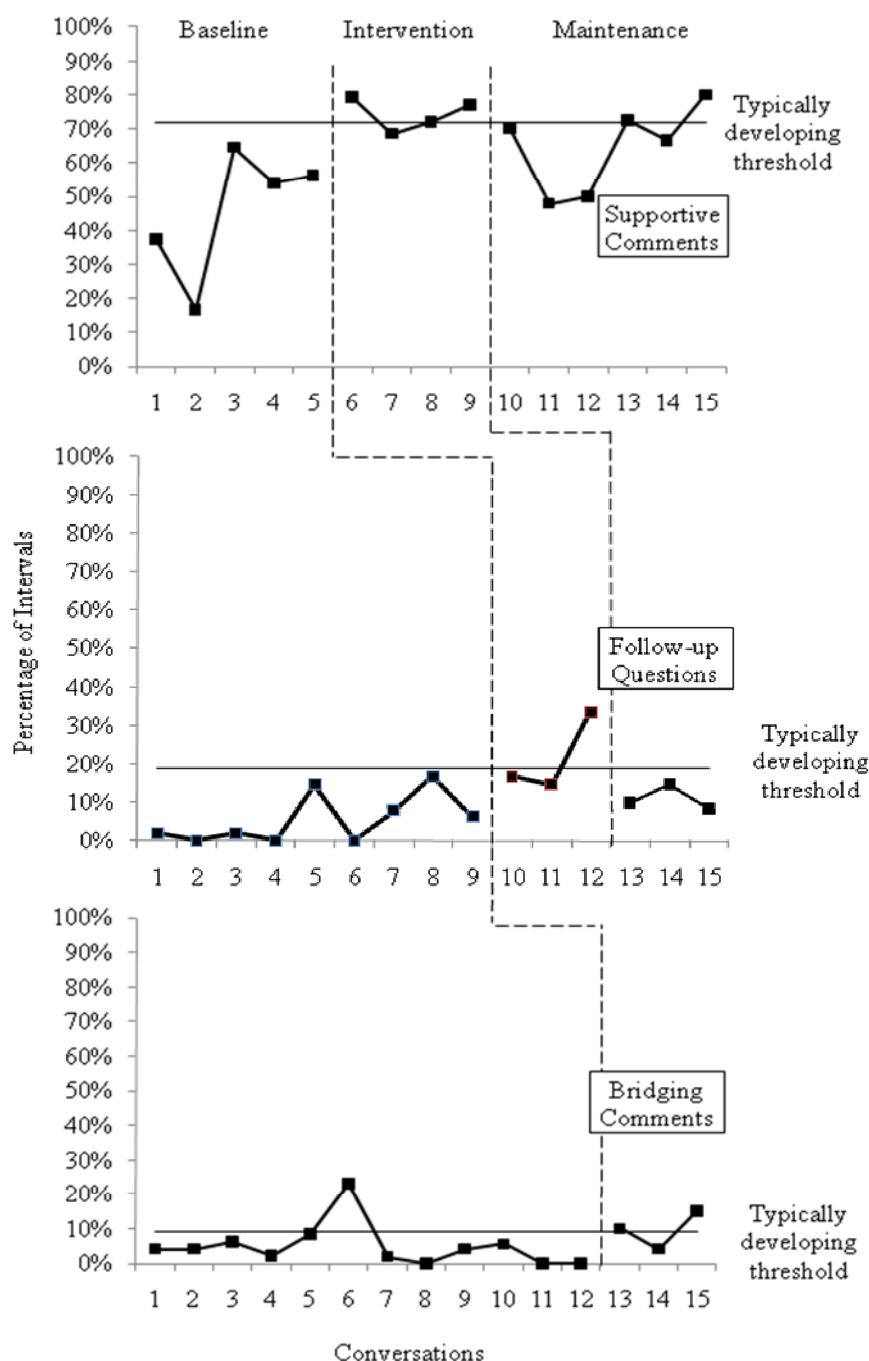
Brett's Analogue Results for the Three Targeted Skills

Figure 2. Note: The solid black line represents the typically developing threshold: supportive comments = 72%, follow-up questions = 19%, bridging = 9%.

Figure 3.

Misty's Analogue Results for the Three Targeted Skills.

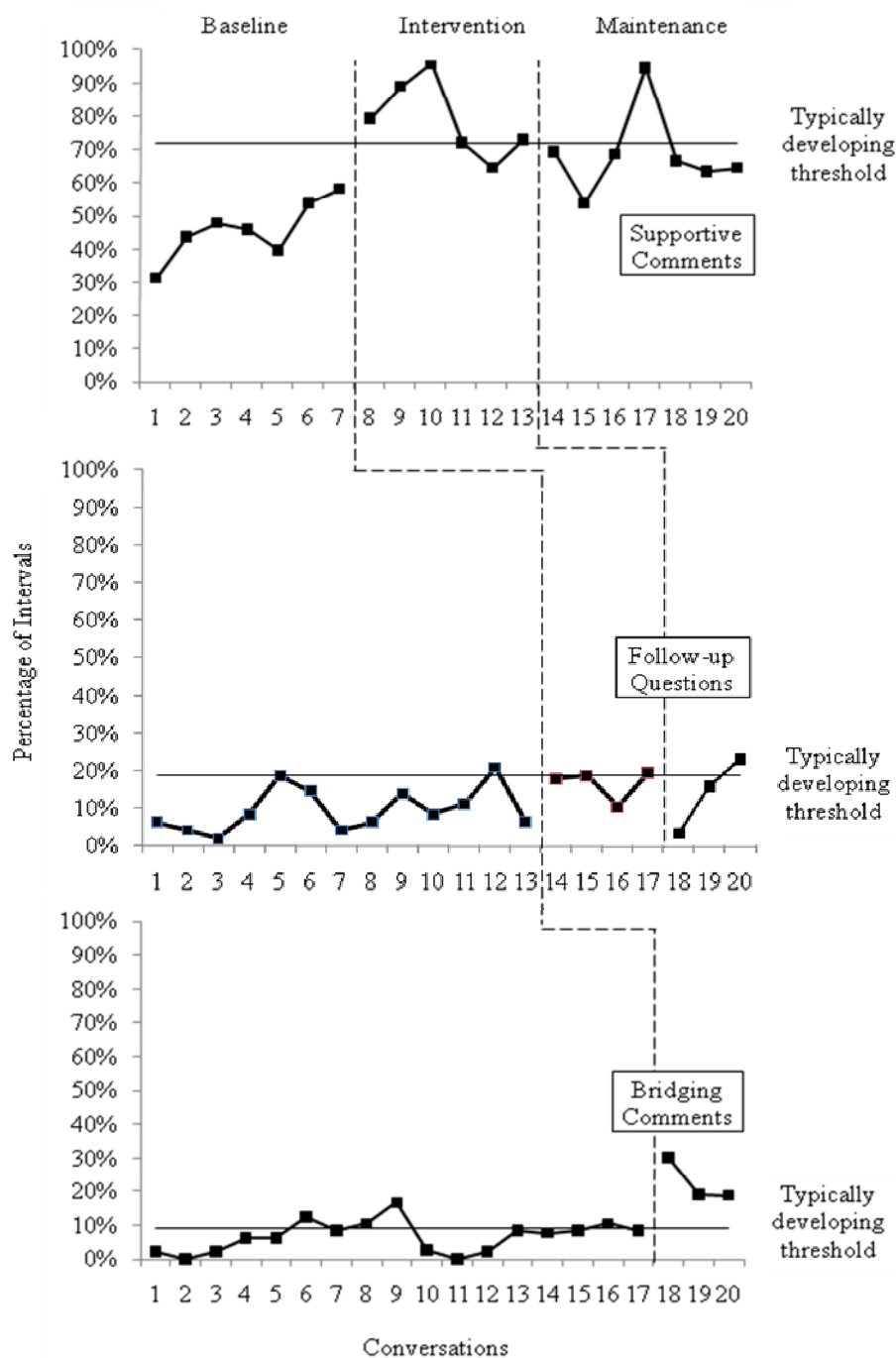


Figure 3. Note: The solid black line represents the results for the typically developing threshold: supportive comments = 72%, follow-up questions = 19%, bridging = 9%.

Steven. Steven's average use of supportive comments increased from 38% in baseline to 75% in intervention. He maintained a 63% average use during maintenance. Steven's baseline average for follow-up questions was 9%; and during intervention increased to 23%. Maintenance data increased to a 16% average. His baseline mean for bridging was 3%, and he increased to 9% during intervention. No bridging maintenance data were collected as the school year ended.

Steven's intervention results for supportive comments (75%) was above the threshold of 72% and his maintenance results (63%) were just below the threshold. Follow-up questions intervention average (23%) was above the threshold of 19%, and maintenance results (16%) were just below. Bridging intervention mean (9%) was at the threshold. Maintenance data were not collected on bridging as the school year ended. Figure 3 graphically represents Steven's analogue data results.

Alan. Alan's baseline supportive comments mean was 82%. His average during intervention was 80%, and during maintenance (83%) had no change. His baseline follow-up questions use averaged 5%. He increased during intervention to 21%, yet did not sustain this increase during maintenance (3%). His bridging usage during baseline averaged 8%. His intervention mean was 18%. Maintenance data on bridging were not collected as the school year ended.

Alan's baseline data for supportive comments was at or above the typically developing threshold. He maintained this trend during intervention. His intervention data for follow-up questions and bridging were at or above the typically developing threshold. His follow-up questions maintenance fell far below the threshold. Figure 4 visually represents Alan's analogue results.

Figure 4.

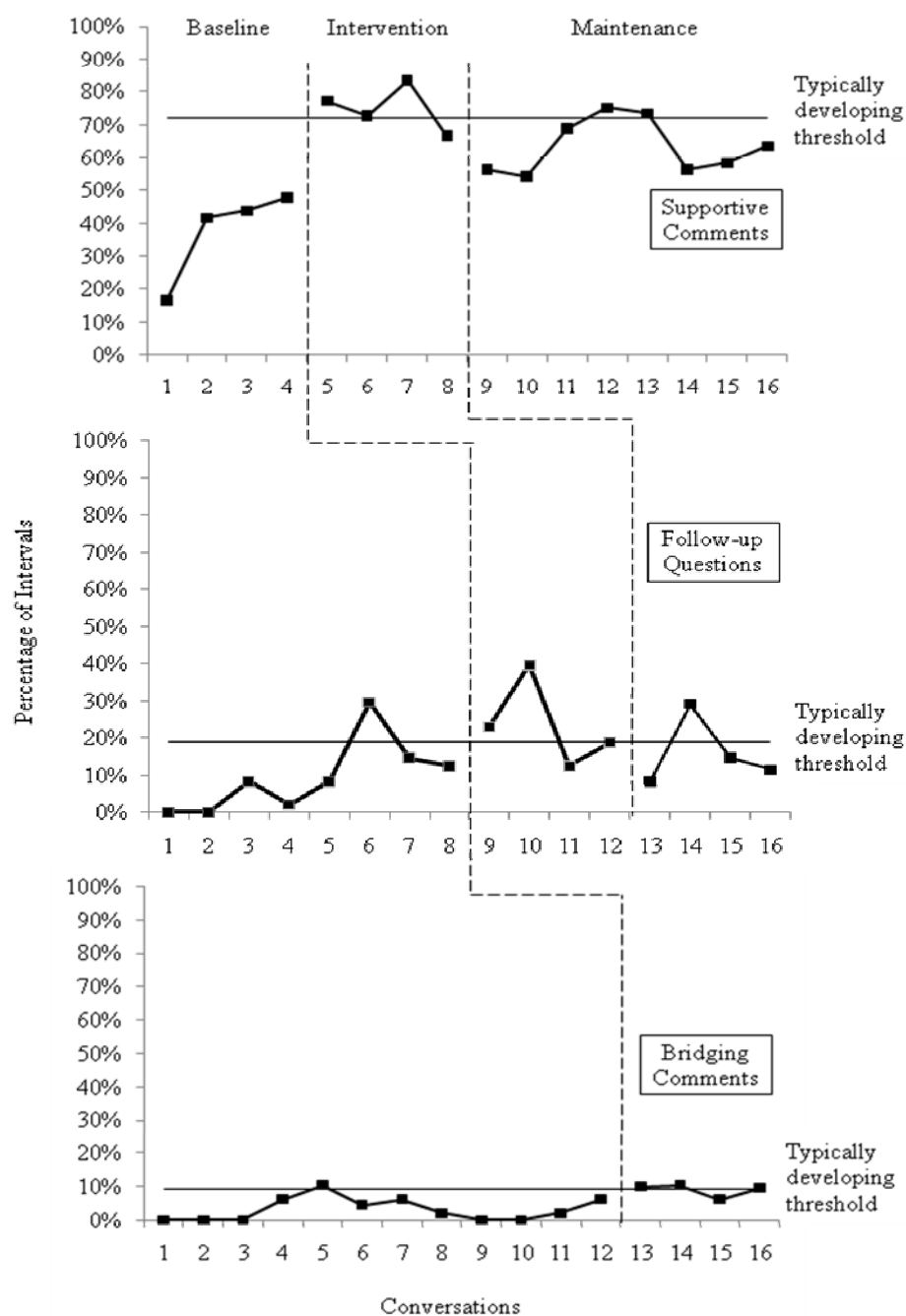
Steven's Analogue Results for the Three Target Skills

Figure 4. Note: the solid black line represents the typically developing threshold for each skill: supportive comments = 72%, follow-up questions = 19%, bridging = 9%.

Figure 5.

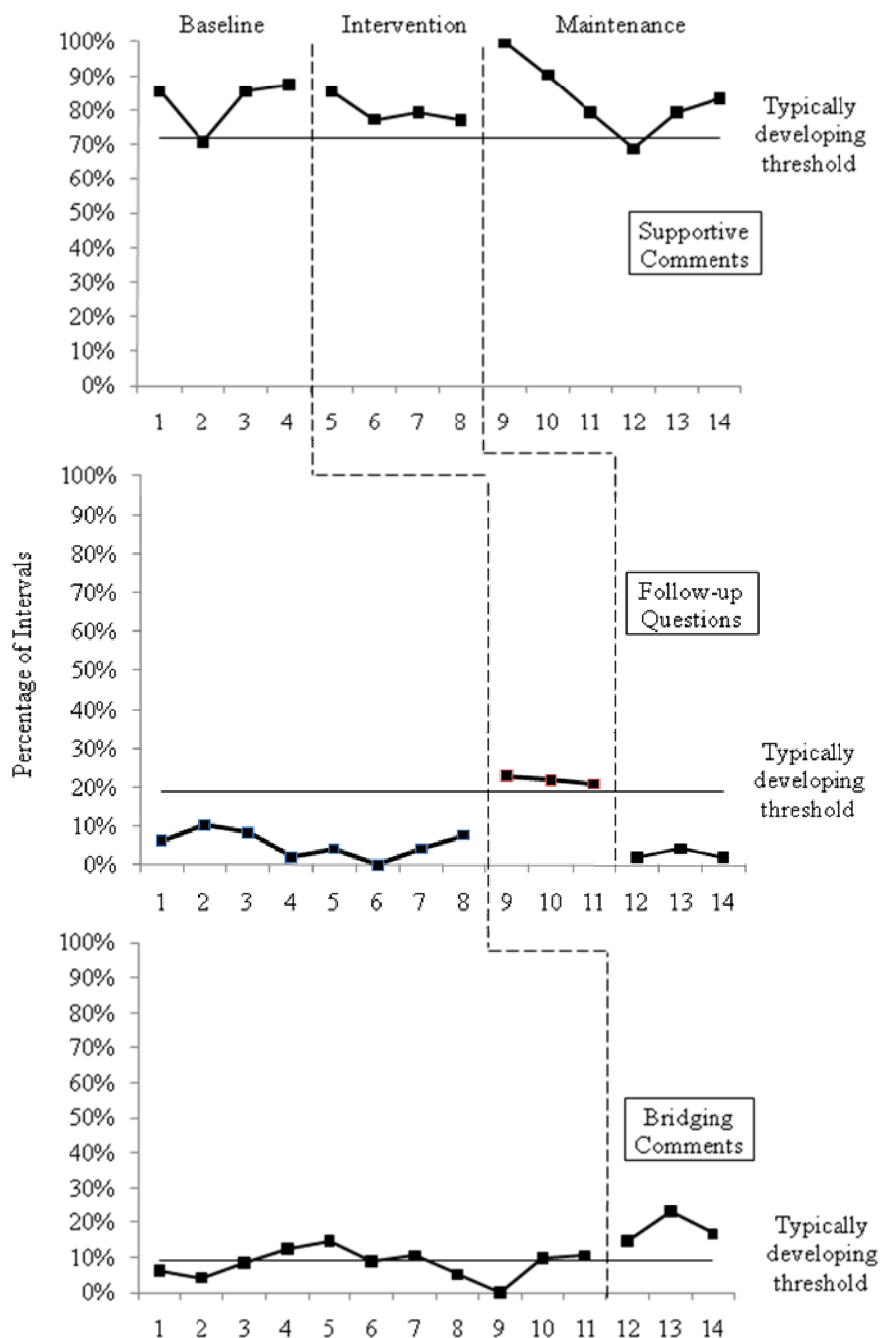
Alan's Analogue Results for the Three Targeted Skills

Figure 5. Note: The solid black line represents the results for the typically developing threshold: supportive comments = 72%, follow-up questions = 19%, bridging = 9%.

Generalization Employment Setting Conversation Data

Steven, Alan, and Misty's employment site results indicated moderate growth in one or more target skills. Brett's job setting changed during the study and therefore was not reported. Steven, Alan, and Misty's supportive comments usage on the jobsite improved during intervention as compared to baseline. Follow-up questions usage during intervention showed some improvement for Steven. Bridging usage during intervention showed improvement for Misty and Alan.

Steven. Steven's supportive comments baseline mean at his employment site was 31%; his intervention mean was 51%. He sustained this usage during maintenance at an average of 49%. Follow-up questions' baseline mean was 5%; and intervention mean was 10%. The follow-up questions maintenance mean was 8%. Steven's bridging baseline mean was 1%; and the intervention mean increased slightly to 4%. In the employment setting, Steven's greatest generalized growth was in supportive comments. Figure 5 represents Steven's employment site conversation data.

Alan. Alan's baseline mean for supportive comments in the employment setting was 43%, and his intervention mean was 65%. He sustained this usage in the maintenance phase at 68%. The baseline mean for follow-up questions was 8%, and the intervention mean was 15%. His follow-up questions maintenance mean was 7%. Alan's bridging mean demonstrated significant growth from a baseline mean of 2% to an intervention mean of 16%. Alan's most sustainable growth in the employment setting was in supportive comments. Figure 6 presents a graphic representation of Alan's results from the employment setting.

Figure 6.

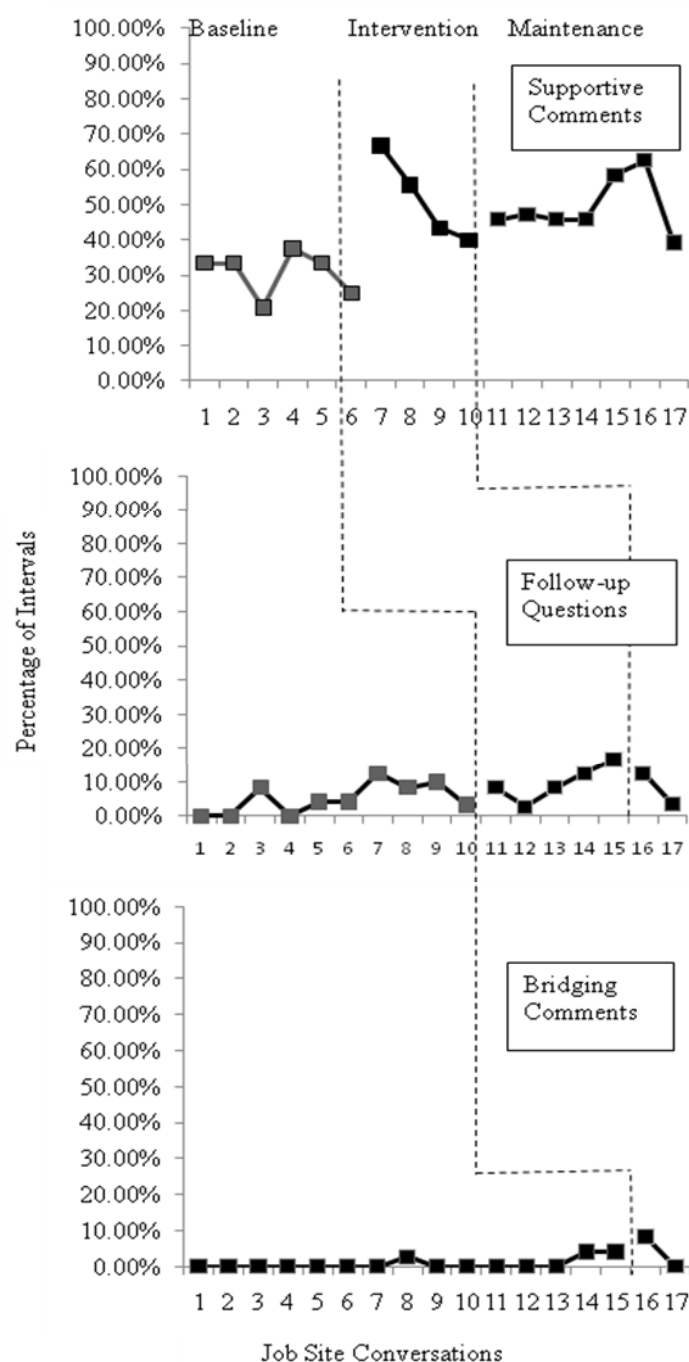
Steven's Employment Conversations Results

Figure 6. Note: Results from Steven's use of the three targeted skills while he worked at the thrift store.

Figure 7.

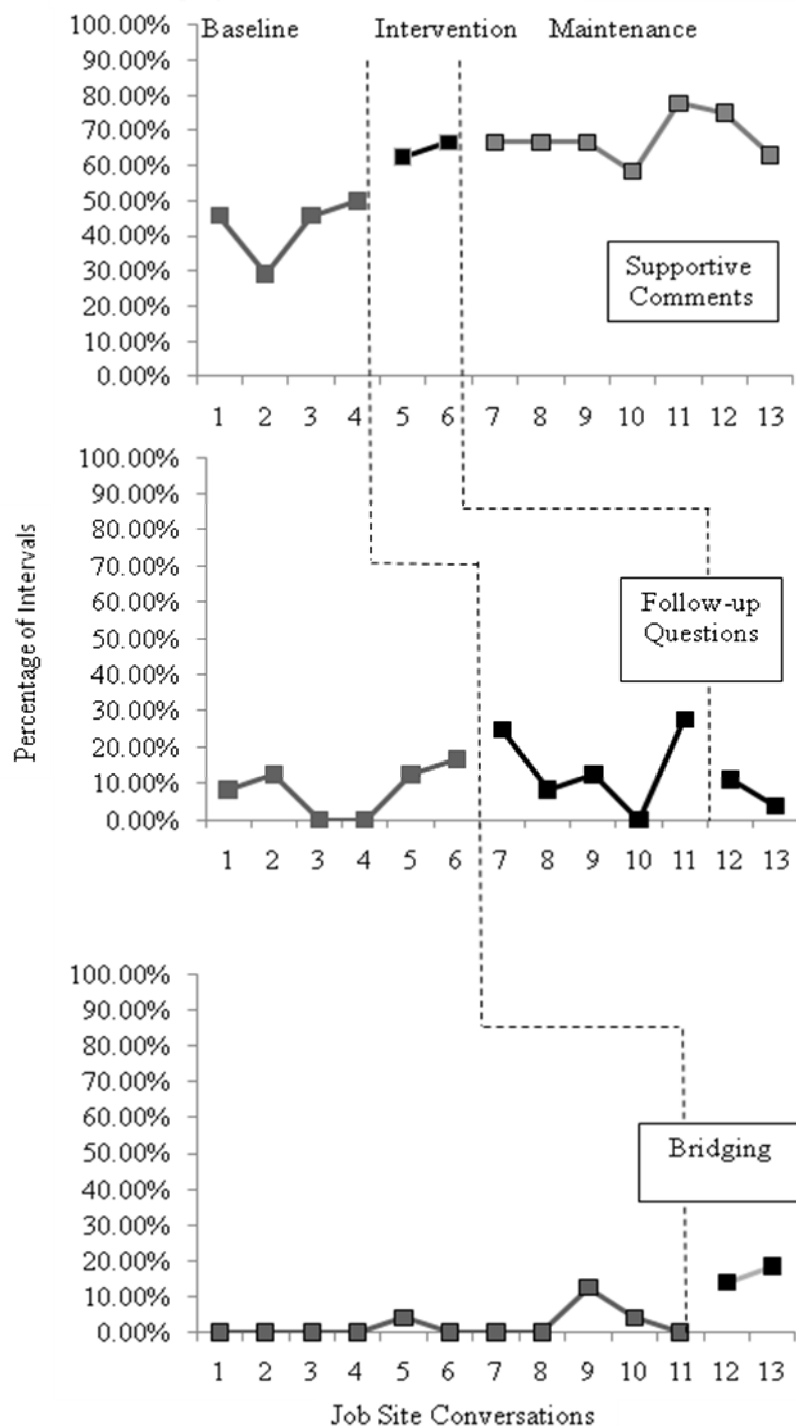
Alan's Employment Conversations Results.

Figure 7. Note: Results from Alan's use of the three targeted skills during his job as a peer helper in a special education class.

Misty. Misty's supportive comments baseline in the employment setting was 42%; while the intervention mean was 65%. Misty maintained a 56% mean during maintenance. The baseline for follow-up questions averaged 7% and increased during intervention to 10%. Misty averaged 17% use of follow-up questions during maintenance, which was higher than intervention results. Baseline mean for bridging was 3%, and intervention was 7%. Misty's greatest generalized growth in the employment setting was supportive comments. Figure 7 represents Misty's employment setting conversation data.

Brett. Brett's employment conversation results showed lapses in data as well as opportunities to converse with coworkers as he changed jobs during the study. Therefore, his data was not included in the analysis.

Figure 8.

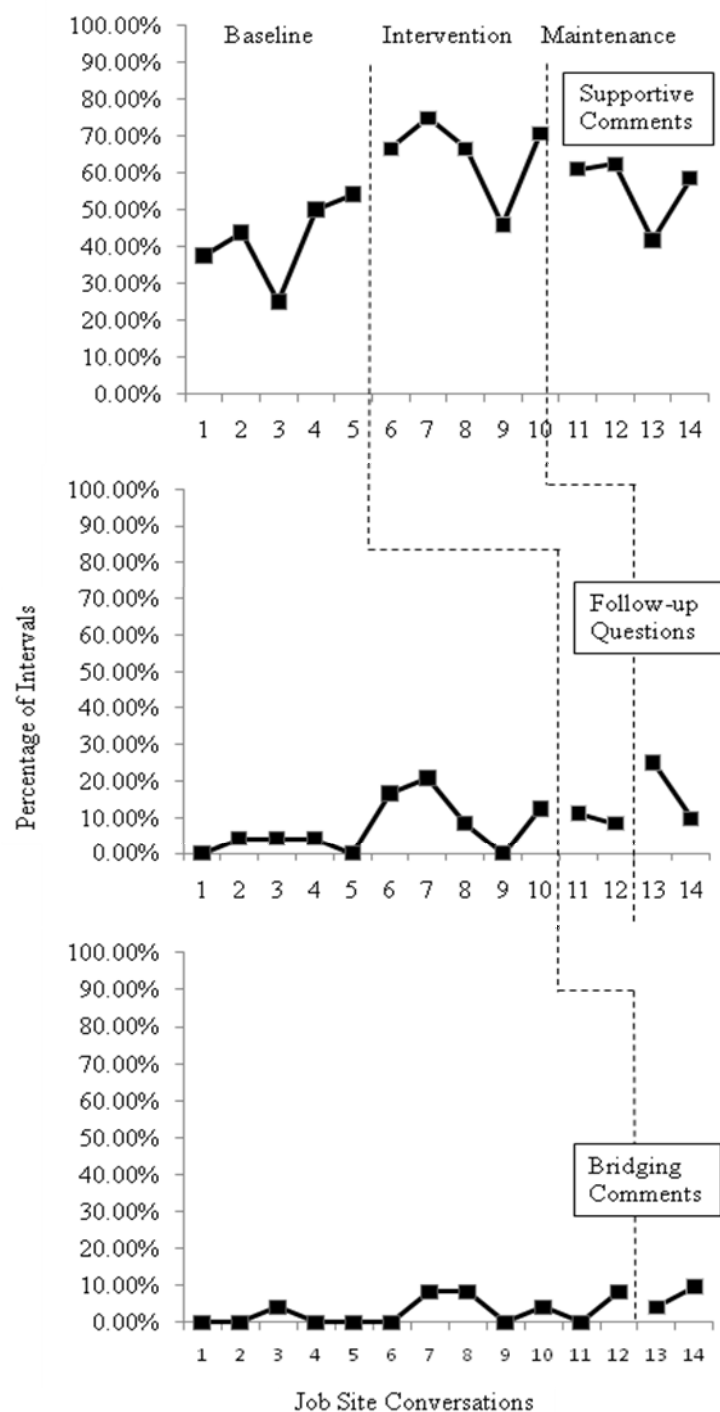
Misty's Employment Conversation Results.

Figure 8. Note: Results from Misty's use of the three targeted skills while she worked at a retirement facility.

Employability Skills Survey Results

The employer and job coach mean ratings of the participants' social and communication skills increased over the length of the study. Steven's mean ratings increased from 1.0 in initial baseline to 5.71 at the end of the study. Alan's mean ratings increased from 4.57 to 5.14. Misty's mean score improved from 3.14 to 4.86 with one score at 6.0 during the follow-up questions phase of the study. Brett's mean score showed improvement in his first job from 3.57 to 4.29 and in his second job from 3.86 to 4.57.

Social Validity Results

Social validity was assessed during the study through informal interviews of the teachers, participants, job coaches, and employers. A sample of the interview questions is in Appendix G. The questions focused on reviewing the use, effectiveness, and beneficial aspects of the skills and the intervention. The social validity results are organized within the following themes: (a) participant responses, (b) teacher responses, and (c) employer and job coach responses. Each group provided positive responses regarding the effectiveness of the intervention as well as areas for further improvement.

Participant responses. All of the participants expressed that they felt their social and conversational skills improved as a result of this study. During the study, Misty made a point to describe a story to the researcher where she used body language and eye gaze skills in a conversation she was having with a paraprofessional. She expressed great pride in her use of the skill, and she commented that she felt it made the conversation "work better." Brett stated that he enjoyed the conversations with the peer model and appreciated the "help with conversations" that the researcher provided. When asked if the training on supportive comments or asking

follow-up questions was helpful to him, Brett explained that he was better at asking questions of other people and listening to their interests during a conversation.

Alan communicated that the problem solving component of the study as well as the follow-up questions and bridging training were most beneficial for him as he believed his greatest difficulty was interpreting and responding effectively to social cues. Alan stated that he has always had difficulty in the moment knowing what to do to fix a problem with a topic that he has brought up. He explained that he notices when a conversation partner is uncomfortable, but he still responds ineffectively. He said that the intervention steps regarding thinking about the other person's feelings and then altering communication with questions or comments about the other person were beneficial for him in repairing these uncomfortable situations. He commented that he wished "the neurotypical world would accommodate the aspie world as much as the aspie world has had to accommodate the neurotypical world". He further remarked that, "I feel I have to change my true self and become something fake to me to manage in the neurotypical world. But the neurotypicals are not doing anything to accommodate my true self." He believed, though, that the steps in this study would help him to continue to manage the neurotypical world when he moves on to college and careers.

Steven invited the researcher to his person-centered planning meeting and commented that he enjoyed the conversations with the peer model. He emphasized that the best part of the training and the conversations was that he learned how to talk to someone he didn't know and realize they had similar interests. He admitted during the study that he avoided conversations because "I don't like to talk." As a result of the training, though, he acknowledged that using the strategies (e.g. thinking about the other person's thoughts and feelings, establishing a physical presence), would result in others not pushing him so intensely to follow their directions.

Through the training he recognized that people in authority, such as his job coach, teachers, or employers, responded to his negative statements or silence with further talking to elicit cooperation. He admitted that when he thought about their responses and provided a positive response to their requests, they would discontinue pushing.

Teacher responses. Throughout the study, the researcher met with the teaching staff to examine the use of the skills outside of the analogue setting. The teachers provided positive, rich comments and examples about the social and communication skill usage in the school setting. One teacher stated that she has been working with Brett for three years and has often worked with him on asking questions during conversations, but she had not witnessed a spontaneous question from him until he started this project. She has seen beneficial growth from him as a result of this study. Another teacher made similar comments regarding Misty's growth. She stated that she could tell Misty was using the social and communication skills in multiple settings as she recognized Misty was adjusting her body to be "part of the group" and adjusting her language to show interest in other people's topics.

Two teachers that work with Steven noted that they were impressed with his social and communication skill growth. They recalled that "Steven would sit in the corner not participating with his body away from the group and his hood over his head." They stated that he has "totally come out of his shell. He is sitting with the group and only 'checks out' of it for a brief moment." The teachers commented that Steven's interests of blood, gore, and death were not usually shared by his peers. They were pleased that during this study he realized how to bring up topics that other people are interested in, instead of talking about his restrictive interests that others might not appreciate. They stated that they have witnessed him bringing up music and jewelry in conversations instead of the topics that he preferred. His teachers commented that

while he was preparing for his person-centered planning meeting that he requested gore topics not be brought up as he recognized that few other people would be interested in them. They stated that he had never voiced the consequences these topics might elicit until now, and they were pleased that he recognized that others may not prefer them. The teachers stated that they feel this study has helped prepare Steven for a longer community employment placement next year when he transitions to the district's full community based program

Two teachers commented on Alan's growth during this study. They have been very concerned about his transition to post-secondary educational settings. They felt that before this study he had not adequately problem solved the consequences of his awkward conversational style nor recognized his responsibility to change his behavior. As a result of this study, they reported that "we are so happy that he is making strides in recognizing some of his awkwardness and how to improve it." They recalled that his greatest difficulty has been in dealing with young women. He had difficulty interpreting and responding appropriately to their social cues. The teachers noted that prior to this study he would discuss a topic in great detail that a conversation partner was not interested in, instead of changing the subject or asking questions of the partner. They were delighted to see him changing a subject by using a bridge or stopping his monologue to ask the partner "what do you think about that?" They felt these skills would help him a great deal when he transitioned to college.

The teachers' greatest concerns were about continuation of the intervention after the study ceased. Brett's teacher noted that Brett would benefit from continuing to work on these skills in multiple settings. She recognized his ability to ask questions in the analogue setting, but noted that he was not asking questions as readily in other settings. She was concerned that he needed to work on initiating and maintaining a conversation at his job site as he often encounters

different employees each day. Alan's teachers were most concerned about his career choice as he needed these skills to be an effective special education teacher. They wanted him to continue developing these skills during college as they were concerned that he may lose the skills without ongoing intervention in multiple adult settings (e.g. college classes, independent living, residential). In addition, two of the teachers agreed that Misty could use ongoing social and communication skill training when she transitions to the district's full community based program. She has shown resistance to this transition as she does not want to leave the high school setting. The teachers explained that further social and communication skill training would assist with a smooth transition.

Employer and Job Coach Responses. The employers and job coaches provided useful comments regarding the study's impact on the participant's employability. One employer commented that Alan "appears normal and that throws people off when they talk to him, because he ends up being stiff and somewhat condescending." As a result of this study, the employer believed that Alan appeared more relaxed and cooperative in group activities with his peers. He also admitted that the study helped Alan recognize his duties as a peer helper. Before the study, he attempted to act as the teacher with his peers with more severe disabilities by being condescending and somewhat authoritative. The employer commented that during the study Alan acted more as a peer to students with more severe disabilities than an authority figure, and when he made the mistake of being condescending he apologized for it. The employer reported the study helped Alan to understand his role in casual as well as professional social settings, which was critical for his future employability.

Future employability was the focus of the comments from Steven's job coach as well. The job coach stated that she had worked with Steven for two years and that the skills from this

study assisted him in transitioning to a community employment placement for the following year. She commented that no one had explained the consequences of his actions in a manner that he understood until he started this study. She stated “I don’t think anyone has actually sat down with him and said here’s what will happen when you do x,y, and z. And here is how you should do it differently.” She expressed that he now understands how and when to appropriately engage in casual conversations with his coworkers and what positive consequences will result.

In addition, at the beginning of the study, she reported that his response to instructions was a “no”, “I don’t know”, or silence, and that he would not look directly at her, the employer, or other coworkers. By the end of the study, she noted that he was responding with positive remarks and interacting with coworkers appropriately. Indeed, she commented that he listened to her instructions and said “yes”, “ok”, or asked a question for clarification, and looked at her directly when he was talking to her. She also remarked that when his coworkers wanted to socialize, he would bring up appropriate topics for conversation, like referring to a movie or energy drink that he knew the others liked.

Misty’s job coach expressed growth in Misty’s ability to problem solve at the job site. She reported that Misty learns job tasks fairly quickly, but needs ongoing assistance with problem solving changes in the work environment. Prior to this study, the job coach recalled that Misty would perseverate on a change or problem at a job site, instead of responding flexibly to the change. She noticed that Misty now processes a change or problem with the job coach faster and more effectively.

Furthermore, her job coach reported that at the beginning of the study, when Misty entered a room to deliver mail she consistently used a rehearsed line to deliver the mail, “I have mail for you. Would you like it on your table or with you?” By the end of the study, the job

coach stated that Misty was asking spontaneous questions of the residents such as “how are you today?” and “do you want me to read this to you?” as well as listening to their comments and questions instead of abruptly leaving when her mail delivery was complete. It was also noted by the job coach that Misty engaged in reciprocal conversations with her coworkers towards the end of the study, asking about their weekend plans and the health of their families.

Brett’s job coach would like to continue the skills with Brett after the study. She commented that Brett showed improvement in the analogue setting but not other settings. She stated that Brett “is very focused on his job tasks when he is at work and has difficulty shifting gears to chit chat.” She suggested that Brett continue to work on these skills directly in the job setting so he could generalize the skills to that setting and experience increased employability.

Summary

The results in the analogue setting demonstrated positive improvement in supportive comments usage during intervention and maintenance for three of the four participants. During intervention and maintenance, follow-up questions some improvement for three of the four participants, yet bridging showed negligible growth during intervention. When compared to the typically developing threshold all of the participants during the intervention phase were at, near, or above the threshold across all three skills. The generalization of skill use to the employment setting was not significant. Three of the four improved their use of supportive comments in the employment setting. However, follow-up questions and bridging did not demonstrate improvement during intervention or maintenance with the exception of Steven’s use of follow-up questions and Alan’s use of bridging. The employability skills ratings from employers, nonetheless, indicated mean improvements from baseline to completion of the study in employment related social and communication skills across all four participants.

CHAPTER FIVE

Discussion

The results and future implications of this study will be discussed in this chapter. The discussion will include: (a) overall findings, (b) limitations, (c) implications, and (d) future research opportunities. An emphasis will be placed on analyzing the functional relationship of the results, reviewing the social validity contributions of the study, and exploring future research ideas.

Overall Findings

Using cognitive behavioral social communication techniques to train adolescents with HFASD on social interaction skills is relatively new, making the research base sparse. Additionally, no research exists related to adolescents with HFASD using a social communication or cognitive-behavioral intervention in the generalized employment setting. Much of the cognitive-behavioral and social communication intervention research has been conducted with young children with HFASD and has provided evidence to the intervention's effectiveness at improving peer social interactions as well as mental health conditions (Reaven & Hepburn, 2003; Sofronoff, Attwood, Hinton, & Levin, 2007; Sze & Wood, 2007).

The present study expanded the emerging cognitive-behavioral social communication research base for individuals with HFASD by using the intervention with adolescents (Solomon, Goodlin-Jones, & Anders, 2004; Turner-Brown, Perry, Dichter, Bodfish, & Penn., 2008) and combined skill based training and peer modeling within the cognitive-behavioral social communication framework. The study also adds to the examination of components of the *Social Thinking* curriculum (Crooke, Hendrix, & Rachman, 2007; Garriss, 2007; Zweber, 2002). The purpose of the study was to determine if the intervention would increase the reciprocal social

interactions of four adolescents with HFASD in analogue school and generalized employment settings. An improvement in reciprocal social interactions of the participants with HFASD was determined through a multiple baseline design across three social communication skills: (a) supportive comments, (b) follow-up questions, and (c) bridging comments and questions.

Evaluating the results of a multiple baseline study requires that the researcher establish a functional relationship between the independent variable and the dependent variables. Kazdin (1982) stated that a “critical requirement of demonstrating unambiguous effects ... is that each baseline changes only when the intervention is introduced and not before” (p. 141). In addition, replication of the design across three or more participants, skills, behaviors, or settings is required to establish experimental control (Horner et al., 2005; Kazdin, 1982; Kennedy, 2005). Kennedy (2005) proposed that positive findings from replications provide researchers with “confidence in the robustness of the findings...[and] the integrity of the functional relation” (p.50). Furthermore, the researcher must visually analyze the “level, trend, and variability of performance occurring during baseline and intervention conditions” (Horner et al., 2005, p.170) to determine a functional relationship between the independent and dependent variables. An immediate and consistent visual change in the level and trend of data during the intervention phase adds to the functional relationship determination. Overall findings in the analogue and employment settings were analyzed to determine the functional relationship of the intervention to each of the three skills: (a) supportive comments, (b) follow-up questions, and (c) bridging comments or questions.

Analogue setting. One hypothesis of this study predicted an improvement in the reciprocal social interactions of the participants in the analogue, school setting. Reciprocal social interactions were defined by an increase in the use of supportive comments, follow-up questions,

and bridging comments or questions during conversations with peer models. Overall, during the supportive comments intervention and maintenance phases, three of the four participants showed some skill growth as well as mean level improvements in the analogue setting. One exception was Alan who had demonstrated 80% accuracy of this skill during baseline and maintained this level during intervention and maintenance phases.

The results revealed that the intervention slightly increased the participants' use of supportive comments in analogue conversations with peers. However, Misty and Steven's supportive comments' baselines had increasing trends prior to intervention, so a significant impact cannot be determined. Some impact can be associated with the supportive comments intervention results for Misty, Steven, and Brett as the data maintained an average increase over baseline. Furthermore, each participant's supportive comments usage was at or above the typically developing threshold. For Misty, Brett, and Steven, this also demonstrated an improvement over baseline. In addition, three of the four participants sustained level improvement over baseline during the maintenance phase. Therefore, some impact can be established for supportive comments but a functional relationship cannot be determined due to the increasing trends in baseline.

The introduction of the second skill, follow-up questions, occurred when a consistent intervention mean level improvement of four or more data points in supportive comments was established for each participant. Some impact can also be established with the follow-up questions as Misty, Alan, and Brett showed improved trends during intervention as compared to their baseline trends. Their trend lines during baseline indicated no significant increases, however, during intervention, their data showed an increasing trend. A functional relationship cannot be established though as the data for two of the four participants did not show a stabilized

trend. As well, maintenance results for follow-up questions indicated that each participant regressed to the baseline mean and were unable to sustain the improvements made during intervention.

Comparison to the typically developing threshold for Brett, Misty, and Steven regarding their follow-up questions results provided additional data. During baseline, Brett had 2 out of 12 (22%) baseline data points at the threshold, however a trend at the threshold was never established. Conversely, during intervention, he sustained 2 data points at the threshold and had the third significantly above. Similarly, Misty had 4 out of 13 (30%) baseline data points at the threshold. In contrast, 3 of her 4 intervention data points (75%) were at the threshold. As well, Steven had 2 out of 8 (25%) baseline data points at the threshold, whereas he had 3 out of 4 (75%) at the threshold. These results demonstrated an improvement for Brett, Misty, and Steven regarding the use of follow-up questions to a level similar to their non-disabled peers. However, the results did not establish a strong functional relationship between the intervention and the dependent variable. Perhaps if the intervention had been continued over time, participants would have gained more skill.

Similar conclusions can be drawn regarding the functional relationship between the intervention and the bridging variable. A strong functional relationship could not be determined between the intervention and the use of bridging comments and questions, however, some impact can be established. As compared to baseline trends, the intervention trend lines for all four participants were improving. Baseline trends were static for Steven, Alan, and Misty; and the trend was decreasing in baseline for Brett. During intervention, Misty showed an improving trend of bridging use and sustained that increase across subsequent data points. As well, Alan's results depicted a sustainable trend and mean level increase over baseline. Steven and Brett's

trend lines showed improvements as well. However, more data that stabilized during intervention would improve the robustness of these findings to increase the impact of the functional relationship. As well, when compared to the typically developing threshold, all participants achieved at or above threshold during baseline and intervention perhaps suggesting that participants possessed the skill at a similar level as their non-disabled peers.

Employment setting. The employment setting results used the same criteria and procedures as the analogue setting. The results indicated that the use of supportive comments increased in the employment setting for Steven, Misty, and Alan. Although, similar to the analogue setting, baseline trends for Misty and Alan were increasing prior to intervention. Some impact occurred as the supportive comments intervention means for all three participants were higher than their baseline means. However, follow-up questions and bridging data did not produce significant results. Misty and Alan's results demonstrated increasing trends in baseline, yet they had decreasing trends during intervention. Steven's baseline trend for follow-up questions and bridging was also increasing and continued an increasing trend in intervention. Brett's data were not evaluated due to his job change midway through the study. Generalization cannot be established as a strong functional relationship in the employment setting did not occur.

Employability survey results and employer comments. The employability skills survey provided additional data to evaluate the social communication skills of the participants on the job sites. The employers' evaluations of the participants' social communication skills indicated perceived growth in conversational skills, listening skills, and development and maintenance of relationships. Steven's scores increased from a mean of 1.0 at the beginning of the study to 5.71 at the end of the study. Steven's job coach commented in the survey as well as the interviews that his greatest growth was in improved positive responses to instructions and conversations.

The job coach and employer remarked that Steven's growth in socialization and communication at his job site has prepared him for a competitive community employment site. Misty's survey scores showed improvement from a baseline mean of 3.14 to a mean of 4.86 at the end of the study. Her job coach noted that Misty had improved significantly in her interactions with the retirement home residents. In addition, she improved her social communication skills to a level where she could be considered for longer, community-based job placements. Alan's employment was within the school as a peer helper in a special education class. His survey results indicated little change before and after the intervention (mean of 4.5 to 5.0). Alan's employer commented that his growth was subtle because Alan was socially appropriate in formal situations. He stated that Alan's challenge was casual, informal socialization opportunities.

Social validity. The interviews of the participants, teachers, employers, and job coaches resulted in positive perceptions of the overall effectiveness of the intervention. Many of the comments reinforced the usefulness of the intervention and the need for further examination of the intervention's effects. The teachers stated that each of the participants could benefit from continued application and reinforcement of the skills over the next year as they transition to community-based employment settings and post-secondary education and training. In general, the teaching staff perceived growth with all the participants' social communication skills.

The participants were very complimentary of the effectiveness of the intervention. They stated that the skills helped them improve their conversation skills. Misty and Steven agreed that the skills helped them open up to the peer model and to other peers in their classes. Brett expressed that he enjoyed the conversations with the peer model and learned how to ask questions during a conversation. Alan contended that the skills were very necessary as he wanted to date and wanted relationships to last.

Last, the employers and job coaches added valuable information regarding the necessity of the skills in job settings. Misty's job coach recognized that without more assistance with social communication skills, Misty would not be able to maintain a part-time job as a 4-hour-a-day job would require socializations. Alan's employer also supported the need for the intervention, stating that ongoing social communication interventions will be critical for Alan to problem-solve the social cultures and communication styles of coworkers.

The interviews acknowledged the need for social communication skill development as well as provided examples of perceived effectiveness of the skill development. Evaluating the perspectives of participants, teachers, job coaches, and employers provided unique insight into the use of the skills outside of the analogue setting.

Limitations

A number of limitations to this study materialized during the data analysis. The limited amount of data collection during follow-up questions and bridging raised questions regarding the fidelity of the intervention. Response quality was not examined, which would warrant a more sophisticated definition of skills as well as data collection. The bridging baseline trend for all participants demonstrated skill usage commensurate with typically developing peers which might indicate the instruction may not have been necessary. In addition, the results indicated a possible relationship between follow-up questions and bridging. The complexity of the intervention made it difficult to determine which of the four components might be most effective. The employment setting results for two of the three skills were insignificant adding limitations to the generalization of the skills.

Follow-up questions and bridging results. The limited amount of data collected during intervention for follow-up questions and bridging may have skewed the results. The follow-up

questions results for 3 of the 4 participants (i.e. Misty, Steven, Brett) demonstrated a discernible growth trend but the intervention phase ended before consistent improvement was established. Alan made significant growth in his follow-up questions usage, but with too few data points a functional relationship could not be established.

The complexity of the skills may have required more intensive instruction and time. Asking questions appropriate to the topic and partner's interests assists in the development of reciprocal communication (Landa, 2000). However, for individuals with HFASD, focusing on a conversation partner's interests and perspectives can be difficult and may require intensive instruction (Baron-Cohen, 1995; Bauminger, 2007a; Myles & Simpson, 2005). Individuals with HFASD ask multiple questions related to their restrictive interests instead of shifting attention to their partner's interests. Asking such questions can cause isolation from their peers (Frith, 2001) and termination from employment (Hurlbutt & Chalmers, 2004). Therefore, more instructional time on the target skills may have resulted in consistent trends of improvement for the participants. Unfortunately, as the end of the school year was approaching, the researcher chose to move onto subsequent skills once a minimum of three data points was collected.

Additionally, considerable scheduling changes occurred during the middle portion of the study when two skills were introduced (i.e. follow-up questions and bridging). All students had interruptions during follow-up questions and bridging intervention phases (e.g. Spring Break, illness, testing schedules, vacations). While attempts were made to alter the schedule, the multiple changes may have impacted the reliability of the participants' results and the fidelity of the instruction.

The results for the male participants may have improved if the peer models were also males, as follow-up questions and bridging require discussing common interests. As the peer

models were female, it may have been difficult for the male participants to develop follow-up questions and bridges related to common interests.

Skill definition and data collection. As the study progressed, the researcher recognized that evaluating the quality of the intervention might be as important as calculating the number of responses. For all three skills, one and two word responses or questions (e.g. “yes,” “no,” “how’s that,” “not really”) were counted the same as full sentences. Oftentimes, such short phrases met the minimum definition but did not appear to encourage conversation. A more sophisticated definition, data collection, and intervention might have increased the reciprocity of the interaction. Certainly, future research should consider response quality as this could be a key issue for youth with HFASD.

Bridging baseline commensurate with typically developing threshold. The researcher established the typically developing threshold toward the end of the study, because participants’ follow-up questions and bridging baseline data were far below the anticipated 80%. The question of how often these skills were actually used in natural conversations among peers without disabilities was considered. The researcher created the threshold as a comparison to determine if participants were actually achieving skill levels commensurate with typically developing peers. The bridging baselines of Brett, Misty, and Alan indicated that they were consistently using the skill at the typically developing threshold. In addition, the typically developing threshold was ascertained using a convenience sample of seven observations among seven different females. Therefore, while a preliminary comparison can be made, a larger sample is needed to increase the strength of the comparison.

Possible relationship between follow-up questions and bridging. Maintenance results for follow-up questions and bridging revealed a unique phenomenon that may have impacted the

results. When 3 of the 4 participants used bridging, follow-up questions simultaneously decreased. This may indicate that these two skills had an impact on one another and may share similarities. A consideration for this interaction effect must be made when determining a significant functional relationship between the intervention and follow-up questions and bridging skills.

Complexity of the intervention. The results did not substantiate a significant impact of the intervention on the three target skills, although the fidelity of the intervention was evaluated by an external reviewer and determined to be consistent across participants. The intervention consisted of four components: (a) conversation supported language activities, (b) peer model role plays, (c) social behavior mapping, and (d) review and feedback sessions. However, each activity varied in length, complexity, and participant preference. For example, conversation supported language activities coupled with role plays required more time and were more intricate than review and feedback sessions or social behavior mapping. The variance in length and complexity of each component may have influenced the limited results.

Furthermore, three of the participants preferred conversation supported language and peer model role plays over the review and feedback sessions and the social behavior mapping. It could very well be that the review and feedback sessions and the social behavior mapping were less preferred because they were perceived as criticism. Steven and Misty stated that they were uncomfortable viewing themselves on video as their socialization errors were more apparent. They also did not like the social behavior mapping because it identified problems they needed to solve. Brett preferred the conversation supported language activities and the peer model role play because he liked talking with the researcher and the peer model. Alan, however, preferred

the social behavior mapping and review and feedback sessions to the conversation supported language activities as he preferred to evaluate himself.

During the Double Interview, some of these social communication characteristics differences among the participants were apparent. Alan preferred to discuss Asperger Syndrome with the intent of improving his behavior, therefore it is possible that his interest in AS may have influenced his preference for self-evaluation and social problem solving. During Misty's Double Interview, she became argumentative when the researcher prompted her to segue off her preferred topic of infants and infant toys, suggesting that she may have difficulty problem solving and evaluating her social communication errors. This social communication characteristic may have impacted her activity preferences. Furthermore, Steven demonstrated a number of non-verbal communication errors during his Double Interview, such as little to no eye contact, flat voice tone, and inappropriate body direction facing away from the researcher, indicating his disinterest in the conversation. Consequently, during the review and feedback sessions, he disliked seeing his non-verbal communication mistakes and requested twice not to view the recording. This may have contributed to his preference of the other activities. The difference in preferences and social communication characteristics may have contributed to the limited results.

The field would benefit from an analysis of the robust nature of each component to determine which components are most valuable to replicate. Anecdotally, the conversation supportive language component coupled with the peer model role play would be considered the most robust as they accounted for the largest amount of intervention time. In addition, three of the participants preferred these two activities over the social behavior mapping and review and feedback sessions. The anecdotal assumption warrants an empirical examination of using

conversation supported language and peer model role plays to improve the social communication skills of adolescents with HFASD.

However, an enhancement to the review and feedback sessions that focuses on successful skill usage and positive behavior reinforcement may also improve the results if added to conversation supported language and peer model role plays. Positive behavior support (PBS) research has maintained that positive reinforcement of students with disabilities results in increased observations of expected and appropriate behaviors (Sugai, & Horner, 2006). Review and feedback sessions could be adjusted to ask questions regarding positive exchanges and successful skill usage. Positive self-examination promoting the active participation of the student is a key component of cognitive behavioral therapy interventions (Gaus, 2007). Combining positive review and feedback sessions with conversation supported language and peer model role plays may produce a robust, student-focused social communication cognitive behavioral intervention.

Employment results. The employment setting results mirrored the analogue setting results indicating some impact but not a significant enough amount to demonstrate generalization of a functional relationship. It could be that the nature of workplace conversations influenced the impact of the results. Alan and Misty had the most opportunities to socialize as they were in helping career areas; whereas Steven and Brett were in industrial jobs with fewer opportunities to socialize. Often the participants' conversations either were cursory or were related to task completion. The participants had opportunities to casually greet coworkers and ask general questions but did not have time to have lengthy conversations. The participants' working hours (average 1 ½) were not long enough to have a break time where in-depth conversations could surface. Hence, the nature of the job site may have impacted the results.

Implications for Future Research

Researchers have evaluated social skills literature for children with autism spectrum disorders to determine the usefulness of single subject design with this population (Lord et al. 2003; White, Koenig, & Scahill, 2007). Developing social communication skills in adolescents with HFASD as they prepare to transition to employment settings is critical as the current research on transition services for adolescents with HFASD is sparse (Mawhood & Howlin, 1999; Howlin, Alcock & Burkin, 2005). This study provided additional research to the developing field of social communication research for adolescents with HFASD as well as preliminary research on the impact of a social communication intervention in employment settings.

According to Jacobs (1994), social communication skills that produce an accurate message for the conversation partner are dependent upon:

the ability to formulate situational demands, to see the potential for pursuing goals, to imagine alternative definitions of a situation, and to construct messages so as to maximally satisfy those demands and goals (p.207).

Social communication skills such as these are paramount for adolescents with HFASD to learn as they are preparing to transition to employment and adult settings (Wehman, Datlow-Smith, & Schall 2009). Adolescents with HFASD would benefit from having realistic socialization interventions during high school to internalize such skills prior to working in competitive employment (Clavenna-Deane, 2009). Although significant increases in target skills in the employment setting were not observed, some changes in workplace social communication skills for 3 of the 4 participants were perceived by the employers and job coaches as improving. As

Hurlbutt and Chalmers (2004) and Muller, Schuler, Burton, and Yates (2003) determined, social and communication skills present significant barriers to sustainable employment for adults with HFASD. Therefore, studies that attempt to generalize social and communication skills to employment settings are necessary. The results of this study demonstrated a need to expand the research to employment settings.

Future research efforts should focus on: (a) establishing a reliable comparison of the social communication skills of typically developing peers and adolescents with HFASD, (b) addressing non-verbal communication behaviors, (c) identifying the social communication skills necessary for successful employment placements for individuals with HFASD, and (d) altering the intervention to address the critical social communication skills identified in school and employment settings.

Typically developing threshold comparison. Future social communication research for adolescents with HFASD should first establish a reliable comparison with typically developing peers. Turkstra, Ciccio, and Seaton (2003) observed the interactive behaviors of 50 typically developing adolescents in conversation dyads. Findings indicated that reciprocal verbal and non-verbal communication behaviors were critical to sustaining positive social interactions between typically developing adolescents. The majority of verbal communication in the dyads consisted of “responses ... contingent on the previous utterance of the partner” (p. 123), such as asking direct questions, making supportive responses, answering questions, and finishing a partner’s statements. Non-verbal interactions were identified as eye gaze, nods and shrugs, and facial expressions of positive or neutral emotions. The results revealed that appropriate non-verbal behaviors occurred between 43% and 71% of the time, depending on the gender and race of the participants. Verbal interactive behaviors were recorded in 8% and 91% of the conversation

disaggregated by gender and race. The verbal behaviors with the highest frequency were “responses contingent on partner’s previous utterances” (p. 121) and answering partner’s questions. The most frequent non-verbal behaviors were facial expressions. A replication of Turkstra and colleague’s study with adolescents with HFASD would provide valuable data to determine the critical conversational skills needed to maintain a reciprocal interaction.

Exhibiting and interpreting non-verbal communication behaviors such as those noted by Turkstra and colleagues (2003) should be embedded within an intervention addressing social communication as misinterpreting non-verbal social cues is a defining characteristic of HFASD (Myles & Simpson, 2002; Myles, 2005; Wing, 1992). Burgoon (1994) acknowledged the importance of non-verbal behaviors on interpreting meaning during conversations. The author contended that facial expressions, gestures, body positioning, and voice tone define the contextual significance of a statement. Burgoon explained that language interpretations rely upon non-verbal behaviors and contextual cues to extrapolate the correct intention of the statement. Turkstra and colleagues (2003) supported Burgoon’s assertion by including non-verbal gestures, eye gaze, and facial expressions in the natural interactions observed among adolescents.

Social communication skill interventions for adolescents with HFASD should instruct and collect data on using and interpreting non-verbal communication behaviors during conversation dyads. The conversation supported language activities in the current study’s intervention trained participants to interpret and use non-verbal behaviors, such as body language and eye gaze. However, data collection as to the frequency of appropriate non-verbal communication skills was not collected. To expand the depth of the intervention and address such critical social communication skills, future research should address non-verbal behaviors.

Social communication interventions in employment settings. More research is needed on the communication behaviors in employment settings. Before continuing further intervention studies, researchers should examine the opportunities for socialization associated with different career fields and the frequency of social communication skills in different job settings and tasks. Adults with HFASD have reported that job settings require socialization skills that characteristically are significant challenges for adults with HFASD (Hurlbutt & Chalmers, 2004). Therefore, future research should examine the critical social communication skills for success in employment settings and extend the research to interventions for adolescents with HFASD to improve social communication skills and thereby impact employment sustainability.

Alterations to the Intervention. Limitations of this study suggested that four components to the intervention may have increased the complexity of the intervention and decreased its robustness. The field would benefit from determining the robustness of each component. A reduction of the intervention components would include combining conversation supported language with peer model role plays as one component to the intervention and then including positive focused review and feedback sessions. This alteration may decrease the complexity of the intervention and provide greater opportunity to analyze the robust nature of each component.

Another possible enhancement to the intervention might be the use of video modeling in the employment setting. It was suggested during the social validity interviews to use an iPod in an employment setting to prompt the participant on social communication skills. Participants could use an iPod to access video recordings of conversation starters, question examples, contingent responses, and non-verbal communication behaviors. The prompts would also provide information about coworkers that would assist participants with initiating a topic of mutual

interest. In addition, two coworkers could be recruited to converse regularly with the participants to facilitate practice with using the video modeled conversation prompts. Video modeling research has been used successfully to teach social communication skills to students with autism spectrum disorders (Apple, 2005) and to improve task completion in employment settings (Kellems, 2009). Therefore, using video modeling research may improve the generalization of social communication skills to employment settings.

Concluding Summary

Overall, the findings from this study are consistent with findings from other studies using supportive comments training from the *Social Thinking* curriculum to improve social communication skills in children with HFASD (Crooke, Hendrix, & Rachman, 2006). In addition, the findings support research that has used social cognition and problem solving CBT interventions with children with HFASD (Bauminger, 2007a, b; Gevers, Clifford, Mager, & Boer, 2006; Solomon, Goodlin-Jones, & Anders, 2004). All of the participants increased their use of supportive comments in the analogue as well as employment setting. These improvements were supported by anecdotal interviews with employers and job coaches. However, the impact was inconclusive due to increasing trend lines in baseline. Additionally, impact on follow-up questions and bridging was inconclusive as well due to increasing trend lines and results that did not stabilize. Therefore, a determination of the intervention's effectiveness across the three target skills could not be made.

A comparison was made between the participants' results and the results of natural conversations between typically developing adults. This preliminary comparison revealed that during intervention all participants increased to at or above the typically developing threshold for supportive comments. Three of the participants were also at or above the typically developing

threshold for follow-up questions. Bridging baseline data showed that most were already using the skill at or near the typically developing threshold, at least for frequency of usage. What is still not clear is the quality of the skill, and this needs further examination.

This study also explored the generalization of skills to employment settings. Few studies have investigated the use of social and communication skill interventions in the employment setting (Mawhood & Howlin, 1999; Howlin, Alcock, & Burkin, 2005). This study offers suggestions for further research recognizing the need for social communication skill development in employment settings for adolescents with HFASD. The participants' employers and job coaches noted that the skills were critical for the participants' employment success. Steven's job coach stated that the decision to move him into a full community-based employment setting the following year was a result of him receiving training in social communication skills. She also commented that her focus had always been on job task instruction. Yet, after this study she realized that individuals with HFASD need support in their social and communication skills rather than ongoing support on task completion as they usually learn the tasks effectively but are unable to socialize and communicate effectively. Such results lend credence to the usefulness of the intervention in employment settings and the necessity for increased social and communication skill support at job sites.

Finally, the cognitive behavioral social communication intervention emerged as a promising idea and would benefit from further research to determine its effectiveness. The characteristics of the intervention address at least some of the social communication skill challenges associated with HFASD. The present study added to the HFASD research base and provided the field with further evidence as to the need for social communication skill development in adolescents with HFASD preparing to transition to adulthood.

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Appendix List

Appendix A: Add-A-Thought Worksheet, Curriculum Sample

Appendix B: The Four Steps of Communication Worksheet

Appendix C: Social Behavior Map Example

Appendix D: Fidelity of Intervention Checklist

Appendix E: Observation Checklists

Appendix F: Employability Skills Rating Scale

Appendix G: Sample Social Validity Questions

Appendix H: Participant Consent Forms

Appendix A: Add-a-Thought to Connect to People's Words

People often tell us a little bit about what they are thinking. Then we need to show that we are listening to them and want to learn more about them. To do this we ask questions or make comments about what they tell us. But we don't have to focus on other people the whole time; we can add our thoughts and experiences to what they are talking about as long as we still show that we are interested in them. This is what a "Thinking of You" person would do.

Sometimes we just seem to keep talking about ourselves and we don't act like we really care what the other people are saying. People who act like "Just MEs" always seem to talk about themselves.

Think of how to respond to each of the comments below to show you are thinking about the other person. Then, create a response that a "Just ME" person would say. For example: If I said, "I didn't feel well last night." A "Thinking of You" person might ask, "What was wrong?" or "Do you feel better now?" or "That's a bummer." A "Just ME" person might say, "I felt fine last night." Or "I was sick during vacation."

- a) I had a bad weekend.
- b) I really want a new video game.
- c) I was sick this weekend.
- d) I had a fun time last night.
- e) I had a hard test in Biology.
- f) The speaker yesterday was terrible.
- g) I wish it was summer vacation.
- h) My sister broke her arm.
- i) I don't like school.
- j) I wish I could take auto mechanics next year.
- k) Our teacher looked funky today.

(Winner, 2005b, p.137)

Appendix B: The Four Steps of Communication Worksheet

The Four Steps of Communication

- 1. Thinking about people and what they think and feel**
 - a. Ask yourself, “What are the people near me interested in?”
 - b. How do they feel about what you are saying?
 - c. What are you doing to show you are interested in them when they are talking?
- 2. Being aware of your physical presence as well as the physical presence of others.**
 - a. Your body position shows who you want to talk to (or who you do not want to talk to).
 - b. Your body movements show what you plan to do next. This communicates messages to people, even if you are not trying to communicate.
 - c. Your body language and facial expression communicate how you feel about things and people around you.
- 3. Using your eyes to think about others and see what they are thinking about**
 - a. The direction of people’s eyes lets others see what they might be thinking about.
 - b. We use our eyes to help figure out how other people feel, what they are thinking about , and if they are interested in the other people they are with.
- 4. Using your language to relate to others**
 - a. Talk about things that are interesting to others.
 - b. Ask questions to find out about people; make comments to show interest.
 - c. Add your own thoughts to connect your experiences to other people’s experiences.
 - d. Adjust your language to what the group or other person is talking about.

(Winner, 2005b, p.117)

Appendix C: Social Behavior Map Example

Title of Situation Being Mapped: Downtime Between Classes/Hallway Behavior (Winner, 2007)

Expected Behaviors	How they make others feel	Consequences you experience	How you feel about yourself
<p>Observe what is going on around you/ and who is around you;</p> <p>Greet your friends or acquaintances;</p> <p>Use a big greeting the first time you see someone that day;</p> <p>Decrease the size of the greeting as you continue to see that person throughout the day</p>	<p>Relaxed</p> <p>Happy</p> <p>Friendly</p> <p>Easygoing</p>	<p>You won't bump into others.</p> <p>You can anticipate when someone will talk to you.</p> <p>People will think you are friendly</p> <p>They will continue to say "hi" to you.</p>	<p>Ready</p> <p>Pleasant</p> <p>Accepted</p>
Unexpected Behaviors	How they make others feel	Consequences you experience	How you feel about yourself
<p>Walking quickly between classes with your head down;</p> <p>Repeatedly greeting with big greetings to those whom you have already greeted that day;</p> <p>Pushing your way through people to get to class</p>	<p>Ignored</p> <p>Irritated</p> <p>Annoyed</p> <p>Angry</p>	<p>Students will think you are unfriendly and won't talk to you;</p> <p>People may think you are strange or different and avoid you;</p> <p>People may think you are rude</p>	<p>Rejected</p> <p>Sad</p> <p>Lonely</p> <p>Stressed</p>

Appendix D: Fidelity of Intervention Checklist

Lesson 1: Introduction of Four steps to Communication

- Step 1 of 4 steps of communicating p.117(WS) _____
 - Thinking about people and what they think and feel _____
 - Rank order the ways to think about others _____
 - Ask what can you do to show others you are interested in what they are interested in? _____
- Pictures of emotions – what are people thinking and feeling, would you feel the same way P. 64 (TS) – (PM – display emotion) _____
- Introduce supportive comments as a way to show that you are thinking about what others think and feel _____
 - Use pg. 134 (WS) – comments – short vs long, tie to emotions _____
- Social Behavior Mapping _____
 - Working in a small group SBM p. 48 - 49 _____

Data 1: Conversations with Partners

- Review conversations after each encounter _____
 - Ask what did you think about that conversation? _____
 - What went well and what was difficult? _____
 - How did the initiation go? _____

Data 2: repeat Data 1, plus review recorded conversations for review and feedback

Lesson 2: Step 2 of 4 steps of communication – p. 117 (WS)

- Establishing physical presence _____
 - Rank order components of physical presence _____
 - Discuss awareness of physical presence _____
 - What can you do to establish physical presence _____
- Establish physical presence activity p. 61-62 (TS) – activity #3 (PM) _____
- Review supportive comments _____
 - Add-A-Thought worksheet p. 136-137 (WS) _____
 - Supportive comments activity p. 255 (TS) (PM) _____
- SBM – Time between classes – works on establishing physical presence as well as comments in short conversations. _____

Data 3: repeat Data 1

Data 4: repeat Data 2

Lesson 3: Step 3 of 4 steps to communication – thinking with your eyes

- P. 117 (WS) Rank order, discuss _____
- Thinking with your eyes activity – p. 68 (TS) #1 and _____
 - # 4 Who am I talking to? (PM) _____
 - Thinking with your eyes (WS) p. 192 _____
- Follow-up Questions activity p. 129 (WS) _____
 - Explain difference between supportive ?s and FU?s _____
- SBM –p. 38-39 Participating in Class Discussions – work on supportive comments and follow up questions that go along with this setting _____

Data 5: Repeat Data 1

Data 6: Repeat Data 2

Lesson 4: Step 4 of 4 Steps to Communication – Using Language to Relate to Others

- Using Language to Relate to Others
 - P. 117 (WS) Rank order the ways we use language to relate _____
 - Discuss the language steps we have learned – supportive comments, follow up questions _____
 - What else can you do to use language _____
- Follow up Questions
 - Target (WS) p. 130 – use in conversation with (PM) _____
 - Making Brain videos (WS) p. 132-133 _____
 - FUQ activity (TS) p. 253 # 2 (PM) _____
- SBM – Researcher Created related to worksite _____

Data 7: Repeat Data 1 _____

Data 8: Repeat Data 2 _____

Lesson 5: Review 4 steps of communication and Bridging Comments or Questions

- P. 117(WS) Review 4 steps and their importance _____
- Bridging
 - P. 140 (WS) Supporting and Add a Thought Comments
 - Use to introduce bridging, when do you use bridging _____
 - Demonstrate in conversation with peer model (PM) _____
- SBM – Researcher Created related to worksite _____

Data 9: Repeat Data 1 _____

Data 10: Repeat Data 2 _____

Lesson 6: Review 4 Steps and Bridging

- P. 117 (WS) Review 4 steps and their importance _____
- Bridging
 - P. 141 – 142 Baiting vs Bridging _____
- SBM – Researcher Created related to worksite _____

Data 11: Repeat Data 1 _____

Data 12: Repeat Data 2 _____

Maintenance

Data 13: Repeat Data 1 _____

Data 14: Repeat Data 2 _____

Employment Setting

Student:

Time: _____

Date: _____

Setting: _____

Observer: _____

Comments:

Adapted from Hansen,
B.D. 2009

[illegible][illegible]

Observation Checklists Code Definitions

Code	Definition
Supportive comments	listened to partner's topics and developed comments or gestures that relate back to partner's topics
Follow-up Questions	listened to partner's topics and developed in-depth questions that probe for more info on partner's topics
Bridging Comments or Questions	a related but new topic was brought up with a comment or question to move the conversation in a different direction

Code	Example
Supportive comments	Oh Yeah! or Really! or head nodding
Follow-up Questions	So you went to the Arch. What was it like? Did you get scared? How did your friends or family feel when they were up in it?
Bridging Comments or Questions	So you went to the Arch. Have you been to any other national monuments? or I've been to the Washington Monument.

Appendix F: Employability Skills Rating Scale

(Adapted from Neath, J. & Bolton, B. (2008). *Work Personality Profile*.)

Section 1: Identifying Information

Name: _____ Date Completed _____

Employer: _____

Section 2: Rating Scale

Instructions: Please rate the employee's social interaction skills on the jobsite using the seven options listed below:

- 7 Excellent
- 6 Good
- 5 Above average
- 4 Adequate
- 3 Inadequate
- 2 Needs Improvement
- 1 Significantly challenging

	Item	Rating							
1.	Responds appropriately when others initiate conversation	7	6	5	4	3	2	1	0
2.	Seeks out friendships with co-workers	7	6	5	4	3	2	1	0
3.	Gets along well with co-workers	7	6	5	4	3	2	1	0
4.	Appears comfortable in social interactions	7	6	5	4	3	2	1	0
5.	Initiates conversations with others	7	6	5	4	3	2	1	0
6.	Joins social gatherings when available	7	6	5	4	3	2	1	0
7.	Listens while others are speaking	7	6	5	4	3	2	1	0

Appendix G: Sample Social Validity Questions.

For Participants:

- Have you noticed a difference in your conversational skills?
- Do you feel you are using more supportive comments, follow –up questions and bridging comments or questions when you talk to your friends, teachers, coworkers, parents, etc.?
- What has worked well for you with these skills? and What was challenging about these skills?

For School Personnel:

1. How has the participant's social communication skills changed over the past few weeks?
2. What have been some characteristic changes in your (student) over the past few weeks?
3. Do you feel the Social Thinking activities have been beneficial for your (student)?
4. Would you continue these activities with your (student) in the future?
5. Do you feel he or she has become more or less engaged with others?
6. Do you feel he or she is showing more interests in other people's topics and less on his or her own interests?

Appendix H: Participant Consent Forms

Consent was received for all participants prior to beginning the study. If the participant was over the age of 18, he or she signed his or her own consent form. If the participant was under 18 or not his or her own legal guardian, then the parent or legal guardian signed the consent form. In addition, the employers and school staff working with the project provided consent to their participation.

This appendix includes samples of all the consent forms as well as a copy of the assent statement provided to the participants under the age of 18. The following is the order the consents appear in this appendix.

1. Participant consent form.
2. Parent consent form of participant who is not own legal guardian.
3. Assent statement for participant.
4. Conversation partner consent form.
5. Parent consent form of conversation partner who is not own legal guardian.
6. Assent statement for conversation partner.
7. Employer consent form.
8. Teacher/Adult consent form.

Social Cognition and Problem Solving: Taking Aims to Improve Employability Skills for
Adolescents with High Functioning Autism Spectrum Disorders.
Participant Consent Form
(For Students over the age of 18)

INTRODUCTION

The Department of Special Education at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of the study will be to improve the social engagement and employability skills of adolescents with High Functioning Autism Spectrum Disorders such as High Functioning Autism or Asperger Syndrome. The study will address communication and mapping problem solving strategies as a means of improving the employment experiences of the participants in the study.

PROCEDURES

If you agree to participate in this study, the investigator will request verification of your diagnosis of either High Functioning Autism or Asperger Syndrome from your IEP (Individualized Education Plan) through the school. This IEP will not be shared with anyone other than the researcher. Then, the investigator will observe you in conversations with peer models from your school. During this time, you will be trained on the social and communication skills. The investigator will provide instruction on the intervention during your seminar class time twice a week for approximately 10 weeks. The lessons will teach concepts including: body language, communication and problem solving and will consist of paper-pencil tasks, role plays, and diagramming different behaviors in social settings. Peer models will be used to train the skills with you as well as be conversation partners with you. The conversations will be video recorded so the researcher can review with you areas of strength and areas for improvement. The videotapes will be used in presentations by the researcher, as well. The videotapes will be destroyed one year past the final generalization probe date. A small video recording device will be used so as not to be obtrusive in the classroom setting. The researcher will also observe conversations you engage in at your job site during break times or joint work activities to determine if you are using the skills learned in the lessons. These observations will occur once a week for about 30 minutes.

Measurements

Formal and informal assessments will be given to you before the study to determine your characteristics related to Autism or Asperger's Syndrome. These tests will take approximately

45 minutes total to complete. You will take three of the assessments: one on problem solving and two on social and communication skills.

RISKS

If you agree to participate in this study, there may be some slight anxiety risks. Adolescents with Asperger Syndrome often have some anxiety in social situations. Since the activities will involve socializing, some nervousness and anxiety may exist. Preparation on the intervention that helps with socializing, assistance from your teacher, and the allowance to discontinue participation if the anxiety is too great should minimize the risks associated with the socialization. The lessons will occur during non-academic periods (e.g. seminar times) during the school day, so as not to interfere with your daily activities. Every effort will be made to keep the academic, school activities as the priority in your school day. Additionally, the conversations during work times will occur only at designated break or naturally occurring joint work activities so as not to take away from your duties at work. In addition, there may be some concern regarding video recording of the conversations. The video recording device will be small so as not to be obtrusive in the classroom setting. The video recordings will be used to instruct the intervention during role play activities and to review the observations to determine effectiveness of the intervention. They will also be used by the researcher in small meetings and conference presentations. If you have problems with this particular point, we can discuss other recording options such as audio-taping, or ways to make your identity anonymous in future presentations.

BENEFITS

You will benefit from participating in the study by having improved skills and opportunities for socialization. As an adult, you may be presented with a number of changing social environments and may have difficulty with adapting to those changes in employment settings. This intervention intends to help you with these potential social problems, so that you can improve your employability skills and establish productive social interactions at job sites.

GIFT TO PARTICIPANTS

For participating in this study, you will receive a \$50.00 gift card to a large department store such as Wal Mart or Target. Researchers may ask for your social security number in order to comply with federal and state tax and accounting regulations. This is the only instance in which your confidential information will be requested, and the personal information will not be directly associated with the data collected.

PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any way with the information collected about you or with the research findings from this study. The investigator will use a number instead of your name to identify the results. The investigator will not share information about you unless required by law, such as the W-9 required for receipt of the gift card (see above) or unless you give written permission.

This data collected will be used by the investigator for a period of two years from the study's start date. Your permission indicates that this information will be kept open to the investigator for that time period, but your name and any identifying information will not be shared or distributed through this study.

REFUSAL TO SIGN OR OPTION TO CANCEL CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

In addition, you may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about you, in writing, at any time, by sending your written request to:

Beth Clavenna-Deane
University of Kansas, Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS. 66045

If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

If you have any questions about this study and the level of participation you will do, please contact one of the investigators listed at the bottom of this consent form.

Age of Majority Disclaimer

If you are 18 years of age or older, the legal age of majority, you complete this consent form for participation in the program. As well, all rights to information about the project will be given to you. If your parents maintain legal guardianship of you after 18 years of age, then these rights will continue with them as the parent and you will be informed of the project as well and be asked give agreement to participate.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email mdenning@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I have received a copy of this Consent and Authorization form.

Type/Print Participant's Name

Date

Participant Signature

Researcher Contact Information

Beth Clavenna-Deane
Principal Investigator
University of Kansas
Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS 66045
785 864 0798
bacd@ku.edu

Mary Morningstar, Ph.D.
Faculty Supervisor
University of Kansas
Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS 66045
785 864 0682
mmorningstar@ku.edu

Social Cognition and Problem Solving: Taking Aims to Improve Employability Skills for
Adolescents with High Functioning Autism Spectrum Disorders.
Parent Consent Form for Participant
(If participant is under 18 or not own legal guardian)

INTRODUCTION

The Department of Special Education at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish for your son or daughter to participate in the present study. You may refuse to sign this form and not have your child participate in this study. You should be aware that even if you agree to have your child participate, you are free to withdraw him or her from the study at any time. If you do withdraw him or her from this study, it will not affect your relationship with this unit, the services it may provide to you or your child, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of the study will be to improve the social engagement and employability skills of adolescents with High Functioning Autism Spectrum Disorders such as High Functioning Autism or Asperger Syndrome. The study will address communication and problem solving strategies as a means of improving the employment experiences of the participants in the study.

PROCEDURES

If you agree to have your child participate in this study, the investigator will request verification of your child's diagnosis of either High Functioning Autism or Asperger Syndrome from your IEP (Individualized Education Plan) through the school. This IEP will not be shared with anyone other than the researcher. Then, the investigator will observe your child in conversations with peer models from your school. During this time, he or she will be trained on the social and communication skills involved in the intervention. The investigator will provide instruction on the intervention during your child's seminar class time twice a week for approximately 10 weeks. The lessons will teach concepts including: body language, communication and problem solving and will consist of paper-pencil tasks, role plays, and diagramming different behaviors in social settings. Peer models will be used to assist with training the skills as well as being conversation partners with your child. These conversations will be video recorded so the researcher can review with you areas of strength and areas for improvement. The video recordings will be used in presentations by the researcher, as well. The video recordings will be destroyed one year past the final generalization probe date. A small video recording device will be used so as not to be obtrusive in the classroom setting. The researcher will also observe conversations your child engage in at his or her job site during break times or joint work activities to determine if he or she is using the skills learned in the lessons. These observations will occur once a week for about 30 minutes.

Measurements

Formal and informal assessments will be given to your child before the study to determine his or her characteristics related to Autism or Asperger's Syndrome. These tests will take approximately 45 minutes total to complete. Your child will take three of the assessments: one on problem solving and two on social and communication skills.

RISKS

If you agree to have your child participate in this study, there may be some slight anxiety risks. Adolescents with Asperger Syndrome often have some anxiety in social situations. Since the activities will involve socializing, some nervousness and anxiety may exist. Preparation on the intervention that helps with socializing, assistance from your child's teacher, and the allowance to discontinue participation if the anxiety is too great should minimize the risks associated with the socialization. The lessons will occur during non-academic periods (e.g. seminar times) during the school day, so as not to interfere with your child's daily activities. Every effort will be made to keep the academic, school activities as the priority in your child's school day. Additionally, the conversations during work times will occur only at designated break or naturally occurring joint work activities so as not to take away from your child's duties at work. There may be some concern regarding video recording of the conversations. The video recording device will be small so as not to be obtrusive in the classroom setting. The video recordings will be used to instruct the intervention during role play activities and to review the observations to determine effectiveness of the intervention. They will also be used by the researcher in small meetings and conference presentations. If you have problems with this particular point, we can discuss other recording options such as audio-taping, or ways to make your child's identity anonymous in future presentations.

BENEFITS

Your child will benefit from participating in the study by having improved skills and opportunities for socialization. As an adult, your child may be presented with a number of changing social environments and may have difficulty with adapting to those changes in employment settings. This intervention intends to help your child with these potential social problems, so that he or she can improve his or her employability skills and establish productive social interactions at job sites.

GIFT TO PARTICIPANTS

For participating in this study, your child will receive a \$50.00 gift card to a large department store such as Wal Mart or Target. Researchers may ask for your child's social security number in order to comply with federal and state tax and accounting regulations. This is the only instance in which your child's confidential information will be requested, and the personal information will not be directly associated with the data collected.

PARTICIPANT CONFIDENTIALITY

Your child's name will not be associated in any way with the information collected about him or her or with the research findings from this study. The investigator will use a number instead of your child's name to identify the results. The investigator will not share information about your child unless required by law, such as the W-9 required for receipt of the gift card (see above) or unless you give written permission.

The data collected will be used by the investigator for a period of two years from the study's start date. Your permission indicates that this information will be kept open to the investigator for that time period, but your child's name and any identifying information will not be shared or distributed through this study.

REFUSAL TO SIGN OR OPTION TO CANCEL CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, your child cannot participate in this study.

In addition, you may withdraw your consent for your child to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about your child, in writing, at any time, by sending your written request to:

Beth Clavenna-Deane
University of Kansas, Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS. 66045

If you cancel permission to use your information, the researchers will stop collecting additional information about your child. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

If you have any questions about this study and the level of participation your child will do, please contact one of the investigators listed at the bottom of this consent form.

Age of Majority Disclaimer

If your child turns 18 years of age, the legal age of majority, during this project, a consent form will be provided to him/her to participate in the program. As well, all rights to information about the project will be given to him/her. If you maintain legal guardianship of your child after 18 years of age, then these rights will continue with you as the parent.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or write

the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email mdenning@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I have received a copy of this Consent and Authorization form.

_____ Type/Print Parent's Name	_____ Date
-----------------------------------	---------------

Parent's Signature

_____ Type/Print Participant's Name	_____ Date
--	---------------

Participant's Signature

Researcher Contact Information

Beth Clavenna-Deane
Principal Investigator
University of Kansas
Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS 66045
785 864 0798
bacd@ku.edu

Mary Morningstar, Ph.D.
Faculty Supervisor
University of Kansas
Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS 66045
785 864 0682
mmorningstar@ku.edu

Assent Procedures – participant with HFA or AS

I am interested in helping students with High Functioning Autism and Asperger Syndrome become more social while they are in high school. I would like you to take part in a study that would work on this. I will work with you twice a week for about 20-30 minutes for the next 10 weeks. The lessons we will use will consist of paper-pencil tasks; role plays; and diagramming different behaviors in social settings. The role plays will occur with peer models from your school, and the conversations will be video recorded. The peer models will only know that you have Autism or Asperger Syndrome. They won't know anything else personal about you unless you tell them. The video recordings will be used for review with you about areas of strength and areas for improvement, and they may be used in presentations by the researcher.

The lessons will occur during seminar times at school. I will also come to your jobsite once a week to observe your conversations with coworkers. I will visit for about 30 minutes and record any conversations that occur during that 30 minutes.

Some tests will be given to you before the study to show your characteristics of Asperger Syndrome or Autism. These tests will take approximately 45 minutes total to complete.

If you feel awkward during the activities, please let me know and we can stop at any time. I will be happy to answer any questions you may have now or when we are working together. Upon completion of this study, you will be offered a gift certificate of \$50.00.

Do you want to take part in this project?

Social Cognition and Problem Solving: Taking Aims to Improve Employability Skills for
Adolescents with High Functioning Autism Spectrum Disorders.
Conversation Partner Consent Form
(For Students over the Age of 18)

INTRODUCTION

The Department of Special Education at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of the study will be to improve the social engagement and employability skills of adolescents and young adults with High Functioning Autism Spectrum Disorders (HFASD) such as High Functioning Autism or Asperger Syndrome. Individuals with HFASD desire socialization but have difficulty with non-verbal communication and interpreting social cues from body language and tone of voice. The study will address these communication and problem solving issues in both the school and employment settings.

PROCEDURES

If you agree to participate in this study, the investigator will meet with you to discuss the details of the study and train you as a peer model. As a conversation partner, you will engage in conversations with a fellow student with a HFASD. As a peer model, you will be trained on the communication skills that you are expected to model in conversation with the peer with HFASD. The training will occur for one hour either before or after school. You will work with the peer and be observed for about 10 weeks. The conversations that will be observed will take about 10 minutes, twice a week. Observed conversations will be video recorded for review purposes as well as possible use in presentations by the researcher. The videotapes will be destroyed one year past the final generalization probe date. A small video recording device will be used so as not to be obtrusive in the classroom setting.

RISKS

If you agree to participate in this study, there may be some slight risks. Since you will be engaging in conversations during class time, it may take away from your other duties in school. To address this potential problem, consent for you to converse with the student with HFASD will be received from the teacher of the class effected by the study. You will need to be available during your seminar time to train and converse with the student with HFASD. Every effort will be made to keep the academic, school activities as the priority in your school day. There may be some concern regarding the use of the video recording device. The video recording device will be

small so as not to be obtrusive at the job site nor in the classroom setting. The video recordings will be used to instruct the intervention during role play activities and to review the observations to determine the effectiveness of the intervention. These recordings will be used in research presentations at small meetings and moderate sized conferences. If you have problems with this particular point, we can discuss other recording options such as audio-taping or having your identity blacked out of the video recording.

BENEFITS

You will benefit from participating in the study by engaging in appropriate conversations with peers with disabilities. Many adolescents and young adults who have had the opportunity to learn more about their peers with disabilities have benefitted greatly from the awareness and the knowledge they have gained about individuals with disabilities. In addition, you will have the opportunity to assist an individual in improving his or her skills as an employee. This altruistic value presents great benefit to adolescents and young adults who will encounter many people of many different personalities and backgrounds as they become adults and future employees. Having experiences that span a wide range of people may be beneficial in future employment opportunities.

GIFT TO PARTICIPANTS

For participating in this study, you will receive a \$50.00 gift card to a large department store such as Wal Mart or Target. Researchers may ask for your social security number in order to comply with federal and state tax and accounting regulations. This is the only instance in which your confidential information will be requested, and the personal information will not be directly associated with the data collected.

PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any way with the information collected about you or with the research findings from this study. The investigator will use a number instead of your name to identify the results. The investigator will not share information about you unless required by law, such as the W-9 required for receipt of the gift card (see above) or unless you give written permission.

This data collected will be used by the investigator for a period of two years from the study's start date. Your permission indicates that this information will be kept open to the investigator for that time period, but your name and any identifying information will not be shared or distributed through this study.

REFUSAL TO SIGN OR OPTION TO CANCEL CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

In addition, you may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about you, in writing, at any time, by sending your written request to:

Beth Clavenna-Deane
University of Kansas, Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS. 66045

If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

If you have any questions about this study and the level of participation you will do, please contact one of the investigators listed at the bottom of this consent form.

Age of Majority Disclaimer

If you are 18 years of age or older, the legal age of majority, you complete this consent form for participation in the program. As well, all rights to information about the project will be given to you. If your parents maintain legal guardianship of you after 18 years of age, then these rights will continue with them as the parent and you will be informed of the project as well and be asked give agreement to participate.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email mdenning@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I have received a copy of this Consent and Authorization form.

Type/Print Participant's Name

Date

Participant Signature

Researcher Contact Information

Beth Clavenna-Deane
Principal Investigator
University of Kansas
Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS 66045
785 864 0798
bacd@ku.edu

Mary Morningstar, Ph.D.
Faculty Supervisor
University of Kansas
Department of Special Education
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mmorningstar@ku.edu

Social Cognition and Problem Solving: Taking Aims to Improve Employability Skills for
Adolescents with High Functioning Autism Spectrum Disorders.
Parent of Conversation Partner Consent Form
(Used if child is under the age of 18)

INTRODUCTION

The Department of Special Education at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish your child to participate in the present study. You may refuse to sign this form and not have your child participate in this study. You should be aware that even if you agree to have your child participate, you are free to withdraw your child at any time. If you do withdraw your child from this study, it will not affect your relationship with this unit, the services it may provide to you or your child, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of the study will be to improve the social engagement and employability skills of adolescents and young adults with High Functioning Autism Spectrum Disorders such as High Functioning Autism or Asperger Syndrome. Individuals with HFASD desire socialization but have difficulty with non-verbal communication and interpreting social cues from body language and tone of voice. The study will address these communication and problem solving issues in both the school and employment settings.

PROCEDURES

If you agree to have your child participate in this study, the investigator will meet with your child to discuss the details of the study as well as the conversations he or she will engage in, and to train your child as a peer model. As a conversation partner, your child will engage in conversations with a fellow student with a HFASD. As a peer model, your child will be trained on the communication skills that he or she will be expected to model in conversations with the peer with HFASD. The training will occur for one hour either before or after school. Your child will work with the peer and be observed for about 10 weeks. The conversations that will be observed will take about 10 minutes, twice a week. Observed conversations will be video recorded for review purposes as well as possible use in presentations by the researcher. The videotapes will be destroyed one year past the final generalization probe date. A small video recording device will be used so as not to be obtrusive in the classroom setting.

RISKS

If you agree to have your child participate in this study, there may be some slight risks. Since your child will be engaging in conversations during seminar time, it may take away from his or her other duties in school. To address this potential problem, consent for him or her to converse with the student with HFASD will be received from the teacher of the seminar class. Your child

will need to be available during your seminar time to train and converse with the student with HFASD. Every effort will be made to keep the academic, school activities as the priority in his or her school day. There may be some concern regarding the use of the video recording device. The video recording device will be small so as not to be obtrusive at the job site nor in the classroom setting. The video recordings will be used to instruct the intervention during role play activities and to review the observations to determine the effectiveness of the intervention. These recordings will be used in research presentations at small meetings and moderate sized conferences. If you have problems with this particular point, we can discuss other recording options such as audio-taping or having your child's identity blacked out of the video recording.

BENEFITS

Your child will benefit from participating in the study by engaging in appropriate conversations with peers with disabilities. Many adolescents and young adults who have had the opportunity to learn more about their peers with disabilities have benefitted greatly from the awareness and the knowledge they have gained about individuals with disabilities. In addition, your child will have the opportunity to assist an individual in improving his or her skills as an employee. This altruistic value presents great benefit to adolescents and young adults who will encounter many people of many different personalities and backgrounds as they become adults and employees of their own. Having experiences that span a wide range of people may be beneficial in future employment opportunities.

GIFT TO PARTICIPANTS

For participating in this study, your child will receive a \$50.00 gift card to a large department store such as Wal Mart or Target. Researchers may ask for your child's social security number in order to comply with federal and state tax and accounting regulations. This is the only instance in which your confidential information will be requested, and the personal information will not be directly associated with the data collected.

PARTICIPANT CONFIDENTIALITY

Your child's name will not be associated in any way with the information collected about him or her or with the research findings from this study. The investigator will use a number instead of your child's name to identify the results. The investigator will not share information about your child unless required by law, such as the W-9 required for receipt of the gift card (see above) or unless you give written permission.

The data collected will be used by the investigator for a period of two years from the study's start date. Your permission indicates that this information will be kept open to the investigator for that time period, but your child's name and any identifying information will not be shared or distributed through this study.

REFUSAL TO SIGN OR OPTION TO CANCEL CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting you or your child's right to any services you or he or she are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, your child cannot participate in this study.

In addition, you may withdraw your consent for your child to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about your child, in writing, at any time, by sending your written request to:

Beth Clavenna-Deane
University of Kansas, Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS. 66045

If you cancel permission to use your child's information, the researchers will stop collecting additional information about your child. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

If you have any questions about this study and the level of participation you will do, please contact one of the investigators listed at the bottom of this consent form.

Age of Majority Disclaimer

If your child turns 18 years of age, the legal age of majority, during this project, a consent form will be provided to him/her to participate in the program. As well, all rights to information about the project will be given to him/her. If you maintain legal guardianship of your child after 18 years of age, then these rights will continue with you as the parent

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email mdenning@ku.edu.

I agree to take part in this study as a research participant. By my signature I affirm that I have received a copy of this Consent and Authorization form.

Type/Print Participant's Name	Date
Participant Signature	
Type/Print Parent's Name	Date
Parent Signature	

Researcher Contact Information

Beth Clavenna-Deane
Principal Investigator
University of Kansas
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521 J.R. Pearson Hall
1122 West Campus Rd.
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Assent Procedures – Conversation Partner/Peer

"I am interested in working with students with High Functioning Autism or Asperger Syndrome to become more social in high school and at their job sites. I would like you to take part in a study to work with an individual with either High Functioning Autism or Asperger Syndrome. Your involvement will include talking to the student in a short conversation over a period of 16 - 20 weeks at school during seminar. I will be training you to model the social skills during the conversation, and I will be video recording the conversation for review. It will not be shown to any other students but may be shown to a teacher to observe the results. The recordings may be used in presentations by the researcher. Your identity will be concealed (faces and voices) when the recordings are used in presentations. The peer modeling and conversations will take about 20 minutes of your time twice a week. If you feel awkward during the activities, please let me know and you can stop at any time. I will be happy to answer any questions you may have now or when we are working together. Upon completion of this study, you will be offered a gift certificate of \$50.00.

Are you interested in taking part in this project?"

Social Cognition and Problem Solving: Taking Aims to Improve Employability Skills for Adolescents with High Functioning Autism Spectrum Disorders. Employer Consent

INTRODUCTION

The Department of Special Education at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of the study will be to improve the social engagement and employability skills of adolescents with High Functioning Autism Spectrum Disorders such as High Functioning Autism and Asperger Syndrome. The study will address communication and problem solving strategies as a means of improving the employment experiences of the participants in the study.

PROCEDURES

If you agree to participate in this study, the investigator will converse with you about the expectations for you in the study. A detailed explanation and training of the social cognitive and problem solving intervention will be discussed with you so you can reinforce the skills in your daily activities as the student's employer. In addition, you will be asked to rate the student's employability skills while he or she is employed at your job site. The investigator will come to the jobsite 2-3 days a week to observe the student engaging in appropriate social conversations with coworkers either at break times or in joint work activities. The observations will take approximately 5-10 minutes of the work time. Baseline observations will occur for about four weeks with two to three observations per week; the intervention observations will occur for approximately twelve weeks with two to three observations per week; and the maintenance observations will occur one month after the last intervention observation occurs; two observations will take place to record maintenance results. The total time of observations will occur for approximately 20 weeks. The investigator will provide instruction on the intervention during school class time two to three times per week during the intervention phase. Then, observed conversations at the job site will be video recorded for review and data collection purposes only. The videotapes may be used in presentations by the researcher. Since the videotaping will occur in a public place, individuals may be recorded that did not give consent. These individuals identity will be concealed (faces and voices) when the recordings are used in presentations. The videotapes will be destroyed one year past the final generalization probe date. A small video recording device will be used so as not to be obtrusive in the classroom setting.

RISKS

If you agree to participate in this study, there may be some slight risks. There may be conflicts with your employment time and the time it will take to complete the employability skills rating scale. The scale will take approximately 20-30 minutes to complete, and you will be asked to complete it at the beginning and end of the project. In addition, the training may conflict with the demands of your job. The training will take about an hour for the investigator to review the information with you so you can reinforce the socialization strategies with the student in your interactions with the student. If these conflicts occur, the investigator will work the schedule so your schedule is available for the training and observations. As well, the length of the study may be cumbersome for you with your job duties. If this is a problem, please let the investigator know so she can work with you to be more accommodating, such as doing the training during a non-work time. In addition, there may be some concern regarding the use of the video recording device due to the other employees at your place of business. The video recording device will be small so as not to be obtrusive and the investigator will not be videotaping anyone other than the student and the consented conversation partner. If you have problems with this particular point, we can discuss other recording options such as audio-taping.

BENEFITS

You will benefit from participating in study by having an opportunity to observe a student with High Functioning Autism Spectrum Disorder in conversations related to his/her interest at your place of business. You will also get to expand your knowledge of HFASD and how best to work with individuals in the future who may work at your job site. Through your interactions with the student, you may also get some additional beneficial knowledge about the personality of the student and what he/she likes to do. Last, you will be able to observe first hand the intervention's effectiveness and see the benefit it may be providing to the student.

GIFT TO PARTICIPANTS

For participating in this study, you will receive a \$50.00 gift card to a large department store such as Wal Mart or Target. Researchers may ask for your social security number in order to comply with federal and state tax and accounting regulations. If you discontinue the study, you will still receive the gift card for partial participation.

PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any way with the information collected about you or with the research findings from this study. The investigator will not share information about you unless required by law or unless you give written permission. This information will be used by the investigator for a period of two years from the study's start date. Your permission indicates that this information will be kept open to the investigator for that time period, but your name and any identifying information will not be shared or distributed through this study.

REFUSAL TO SIGN OR OPTION TO CANCEL CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University

of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

In addition, you may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about you for purposes of the data collection, in writing, at any time, by sending your written request to:

Beth Clavenna-Deane
University of Kansas, Department of Special Education
521 J.R. Pearson Hall
1122 West Campus Rd.
Lawrence, KS. 66045

If you cancel permission to use your information, the researchers will stop collecting additional information about you. However, the research team may use and disclose information that was gathered before they received your cancellation, as described above.

If you have any questions about this study and the level of participation you will do, please contact one of the investigators listed at the bottom of this consent form.

PARTICIPANT CERTIFICATION:

I have read this Consent and Authorization form. I have had the opportunity to ask, and I have received answers to, any questions I had regarding the study. I understand that if I have any additional questions about my rights as a research participant, I may call (785) 864-7429 or write the Human Subjects Committee Lawrence Campus (HSCL), University of Kansas, 2385 Irving Hill Road, Lawrence, Kansas 66045-7563, email dhann@ku.edu.

I agree to allow to take part in this study as a research participant. By my signature I affirm that I have received a copy of this Consent and Authorization form.

_____	_____
Type/Print Participant's Name	Date

Researcher Contact Information:

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Social Cognition and Problem Solving: Taking Aims to Improve Employability Skills for
Adolescents with High Functioning Autism Spectrum Disorders.
Teacher/Adult Consent

INTRODUCTION

The Department of Special Education at the University of Kansas supports the practice of protection for human subjects participating in research. The following information is provided for you to decide whether you wish to participate in the present study. You may refuse to sign this form and not participate in this study. You should be aware that even if you agree to participate, you are free to withdraw at any time. If you do withdraw from this study, it will not affect your relationship with this unit, the services it may provide to you, or the University of Kansas.

PURPOSE OF THE STUDY

The purpose of the study will be to improve the social engagement and employability skills of adolescents with High Functioning Autism Spectrum Disorders such as High Functioning Autism or Asperger Syndrome. The study will address communication and problem solving strategies as a means of improving the employment experiences of the participants in the study.

PROCEDURES

If you agree to participate in this study, the investigator will converse with you about the expectations for you in the study. A detailed explanation and training of the social cognitive and problem solving intervention will be discussed with you so you can reinforce the skills in your daily activities with the student as well as observe conversations the student is having in his/her employment setting to rate the effectiveness of the intervention. In addition, you may be asked to rate the consistency of the instruction provided across the students participating. Baseline observations will occur for about four weeks with two to three observations per week; the intervention observations will occur for approximately twelve weeks with two to three observations per week; and the maintenance observations will occur one month after the last intervention observation occurs; two observations will take place to record maintenance results. The total time of observations will occur for approximately 20 weeks. The investigator will provide instruction on the intervention during school class time two to three times per week during the intervention phase. Observed conversations in the role play activities as well as at the job site will be video recorded for review purposes only. The videotapes may be used in presentations by the researcher. Since the videotaping will occur in a public place, individuals may be recorded that did not give consent. These individuals identity will be concealed (faces and voices) when the recordings are used in presentations. The videotapes will be destroyed one year past the final generalization probe date. A small video recording device will be used so as not to be obtrusive in the classroom setting.

RISKS

If you agree to participate in this study, there may be some slight risks. You may have conflicts with your time that is devoted to the rest of your class. If this occurs, the investigator will work the schedule so your schedule is available for the training and observations. As well, the length of the study may be cumbersome for you with the duties you have as a teacher. If this is a problem, please let the investigator know so she can work with your schedule and duties to be more accommodating, such as doing the training during a non-duty time. In addition, there may be some concern regarding the use of the video recording device due to the other students in your classroom. The video recording device will be small so as not to be obtrusive and the investigator will not be videotaping anyone other than you and the student. If you have problems with this particular point, we can discuss other recording options such as audio-taping.

BENEFITS

You will benefit from participating in study by having an opportunity to observe your student with High Functioning Autism Spectrum Disorder in conversations related to his/her interest as well as interact with him/her using the social cognitive and problem solving interventions. This will give you some additional beneficial knowledge about the personality of your student and what he/she likes to do as well as opportunities to learn a novel approach to teaching social skills. Last, you will be able to evaluate first hand the intervention's effectiveness and see the benefit it may be providing to your student.

GIFT TO PARTICIPANTS

For participating in this study, you will receive a \$50.00 gift card to a large department store such as Wal Mart or Target. Researchers may ask for your social security number in order to comply with federal and state tax and accounting regulations. If you discontinue the study, you will still receive the gift card for partial participation.

PARTICIPANT CONFIDENTIALITY

Your name will not be associated in any way with the information collected about you or with the research findings from this study. The investigator will not share information about you unless required by law or unless you give written permission. This information will be used by the investigator for a period of two years from the study's start date. Your permission indicates that this information will be kept open to the investigator for that time period, but your name and any identifying information will not be shared or distributed through this study.

REFUSAL TO SIGN OR OPTION TO CANCEL CONSENT AND AUTHORIZATION

You are not required to sign this Consent and Authorization form and you may refuse to do so without affecting your right to any services you are receiving or may receive from the University of Kansas or to participate in any programs or events of the University of Kansas. However, if you refuse to sign, you cannot participate in this study.

In addition, you may withdraw your consent to participate in this study at any time. You also have the right to cancel your permission to use and disclose information collected about you for purposes of the data collection, in writing, at any time, by sending your written request to:

Beth Clavenna-Deane
 University of Kansas, Department of Special Education
 521 J.R. Pearson Hall
 1122 West Campus Rd.
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I agree to allow to take part in this study as a research participant. By my signature I affirm that I have received a copy of this Consent and Authorization form.

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Researcher Contact Information:

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